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Important 5 mark question for TN class 12 Physics.

Volume 1

Chapter 1:Electrostatics

1. Explain the important aspects of Coulomb's law.
2. Electric field due to an electric dipole at points on the axial line
3. Electric field due to an electric dipole at a point on the equatorial plane.
4. Electric potential due to a point charge
5. Electrostatic potential at a point due to an electric dipole.
6. Explain Gauss's law and its applications.
7. Derive an equation for the energy stored in a parallel plate capacitor.
8. Derive an equation for a capacitor in series and parallel.
9. Write a note on the Van de Graff Generator.

Chapter 2: Current Electricity

1. Derive an expression for the microscopic model of current and current density.
2. Resistors in series and parallel.
3. Explain the determination of internal resistance.
4. Cells in series and cells in parallel.
5. Wheatstone's bridge.
6. Meter bridge.
7. Explain the comparison of the emf of two cells with a potentiometer.
8. Internal resistance of a cell using a potentiometer.
9. Internal resistance of a cell using a voltmeter.

Chapter 3: Magnetism and Magnetic Effects of Electric Current.

1. Explain the magnetic field at a point along the axial line of the magnetic dipole.
2. Explain the magnetic field at a point along the equatorial line due to a magnetic dipole.

3. How are magnetic materials classified?
4. Derive an expression for the magnetic field due to a long straight conductor carrying current
5. Derive an expression for the magnetic field produced along the axis of the current-carrying circular coil.
6. Derive an expression for the magnetic field due to a long current-carrying solenoid.
7. Explain the motion of a charged particle in a uniform magnetic field.
8. Explain the working of a cyclotron.
9. Explain the force between two long parallel current-carrying conductors.
10. Explain the moving coil galvanometer.

Chapter 4: Electromagnetic Induction and Alternating Current.

1. Derive an expression for motional emf from the Lorentz force.
2. Explain the eddy currents.
3. Explain self-induction and Mutual Induction between two long coaxial solenoids.
4. Explain the induction of emf by changing the orientation of the coil with the magnetic field.
5. Explain the construction and working of a transformer.
6. Explain the various energy losses in a transformer.
7. Find out the phase relationship between voltage and current in a pure inductive circuit.
8. Find out the phase relationship between voltage and current in a pure capacitive circuit.
9. Explain the root mean square value of an alternating current.
10. Explain the AC circuit containing a resistor, an inductor and a capacitor in series - a series RLC circuit.

Chapter 5: Electromagnetic waves

1. Explain Maxwell's equation in an integral form.
2. Explain the production and properties of electromagnetic waves
3. Write a note on the types of electromagnetic spectrum: i)emission spectrum and its types, ii)absorption spectrum and its types.

Volume 2

Chapter 6: Ray Optics

1. Derive the mirror equation
2. Explain Fizeau's method to determine the speed of light.
3. Derive the lens maker formula and lens equation.
4. Derive the equation for the focal length of lenses in contact.
5. Explain the angle of deviation produced by the prism.

Chapter 7: Wave Optics

1. Explain Young's double slit experiment.
2. Prove the laws of reflection using Huygen's principle
3. Prove the laws of refraction using Huygen's principle
4. Explain the diffraction at a single slit and obtain the condition for the nth minimum.

Chapter 10: Dual Nature of Radiation and Matter.

1. Explain the various methods of electron emission.
2. Explain the concept of quantisation of energy.
3. What is a Photoelectric cell, and what are its applications?
4. Explain the Davison and Germer experiment.
5. Explain the working principle and working of the electron microscope.

Chapter 9: Atomic and nuclear physics

1. Explain the determination of the specific charge (e/m) of an electron - Thomson's experiment.
2. Explain Millikan's oil drop experiment.
3. Explain the spectral lines of the hydrogen atom.
4. Derive the equation for the radius of the orbit of the electron.
5. Derive the equation for the energy of an electron in the nth orbit.
6. Obtain the law of radioactivity and radioactive decay.
7. Describe the working of a nuclear reactor with a block diagram.
8. Discuss the alpha decay process with an example.

Chapter 10: Electronics and communication

1. Explain the construction and working of a half-wave rectifier circuit.
2. Explain the construction and working of a full-wave rectifier circuit.

3. State and prove De Morgan's first and second theorems.
4. Explain a transistor as a switch
5. Explain the transistor as an amplifier and sketch the input and output waveforms.

Chapter 11: Recent Developments in Physics

1. Discuss the applications of nanomaterials in various fields.
2. Explain the functions of key components in robots.
3. Write a note on the recent developments in medical diagnosis and therapy.

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-Mark Twain

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