JKBOSE Class 12th Physics – Top 30 Guess Questions 2025

Chapter 1: Electric Charges and Fields

• State and explain Coulomb's law.
• Define electric flux. State and explain Gauss's theorem.
• Derive the expression for the electric field due to an infinitely long charged wire.
• What is an electric dipole? Derive the expression for its electric field on the axial line.

Chapter 2: Electrostatic Potential and Capacitance

• Define potential difference and derive the relation between electric field and potential.
• Derive the expression for the potential due to a point charge.
• Derive the expression for the capacitance of a parallel plate capacitor.
• What is a dielectric? Explain its effect on capacitance.

Chapter 3: Current Electricity

• State Ohm's law and its limitations.
• Define drift velocity and derive the relation between drift velocity and current.
• Explain Wheatstone bridge and its principle.

Chapter 4: Moving Charges and Magnetism

• State and explain Biot–Savart law.
• Derive the expression for the magnetic field at the center of a circular current-carrying loop.
• What is the force on a moving charge in a magnetic field?
• Derive the expression for torque on a current-carrying loop in a magnetic field.

Chapter 5: Magnetism and Matter

• What are magnetic materials? Explain diamagnetism, paramagnetism, and ferromagnetism.
• Derive the relation between magnetic field B, magnetizing field H, and magnetization M.

Chapter 6: Electromagnetic Induction

• State and explain Faraday's laws of electromagnetic induction.
• What is Lenz's law? Explain its significance.
• Derive the expression for self-inductance of a solenoid.

Chapter 7: Alternating Current

• Derive the expression for current in an LCR circuit connected to an AC source.
• Define power factor. Derive expression for average power in an AC circuit.
• What is resonance? Derive condition for resonance in an LCR circuit.

Chapter 8: Electromagnetic Waves

• Explain displacement current and its role in Maxwell's equations.
• Write the characteristics and uses of electromagnetic waves (radio, micro, X-rays).

Chapter 9: Ray Optics and Optical Instruments

• Derive mirror formula or lens formula.
• Explain total internal reflection and its applications.
• State and explain Huygens' principle. Derive laws of reflection and refraction using it.
• Draw and explain the working of a compound microscope or astronomical telescope.

Chapter 10: Dual Nature of Radiation and Matter

• Explain photoelectric effect, its laws, and derive Einstein's photoelectric equation.