CBSE Class 12 Physics Vol 1 (2025-26) – Important Questions

Chapter 1: Electric Charges and Fields
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1 Mark:
- Define electric flux.
- State Coulomb’s law in vector form.

2 Marks:
- Explain why a conductor has no electric field inside it.
- Write Gauss’s theorem and its application for a uniformly charged sphere.

3 Marks:
- Derive the expression for electric field due to a uniformly charged infinite plane sheet.
- Explain electric dipole in a uniform electric field.

4 Marks (Case Study):
- A small sphere is placed in an electric field. Discuss how its charge and motion can be analyzed.
- Numerical based on electric flux through surfaces.

5 Marks:
- Derive expression for electric field on the axial line of an electric dipole.
- Problems based on Gauss’s theorem.

Chapter 2: Electrostatic Potential and Capacitance
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1 Mark:
- Define potential difference.
- Write unit of capacitance.

2 Marks:
- Explain the principle of capacitor.
- Derive relation between potential gradient and electric field.

3 Marks:
- Derive equivalent capacitance of capacitors in series.
- Explain energy stored in a capacitor.

4 Marks (Case Study):
- Capacitor network problem with switch connections and charge distribution.

5 Marks:
- Derive expression for potential due to an electric dipole.
- Numerical based on energy stored in capacitors.

Chapter 3: Current Electricity
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1 Mark:
- State Ohm’s law.
- Define drift velocity.

2 Marks:

- Relation between drift velocity and current.
- Derive expression for electrical resistivity.

3 Marks:
- Derive expression for combination of resistors in series and parallel.
- Numerical based on cell EMF and internal resistance.

4 Marks (Case Study):
- Circuit-based question using Kirchhoff's laws with calculation of unknown current.

5 Marks:
- Wheatstone bridge derivation and meter bridge experiment.

Chapter 4: Moving Charges and Magnetism
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1 Mark:
- Define magnetic field.
- What is Lorentz force?

2 Marks:
- Expression for force on a moving charge in magnetic field.
- State and explain right-hand thumb rule.

3 Marks:
- Derive expression for magnetic field due to a straight current-carrying wire.
- Motion of a charged particle in uniform magnetic field.

4 Marks (Case Study):
- Cyclotron principle and working question.

5 Marks:
- Derive expression for magnetic field on the axis of a circular coil.

Chapter 5: Magnetism and Matter
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1 Mark:
- Define magnetic declination.
- What is magnetic dipole moment?

2 Marks:
- Distinguish between diamagnetic and paramagnetic materials.
- Write relation between magnetic field and magnetization.

3 Marks:
- Derive torque on a magnetic dipole in a uniform magnetic field.
- Earth's magnetic elements explanation.

4 Marks (Case Study):
- Material comparison based on their magnetic properties.

5 Marks:
- Derive expression for magnetic field on the axial line of a bar magnet.

Chapter 6: Electromagnetic Induction
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1 Mark:

- Define magnetic flux.
- What is Lenz’s law?

2 Marks:
- State and explain Faraday’s laws of EMI.
- Expression for motional emf.

3 Marks:
- Derive expression for emf induced in a coil rotating in a uniform magnetic field.
- Explain eddy currents and their uses.

4 Marks (Case Study):
- Practical application of EMI in generators and braking systems.

5 Marks:
- Derive expression for self-inductance of a solenoid.

Chapter 7: Alternating Current
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1 Mark:
- Define RMS value of AC.
- Write the relation between peak and RMS value.

2 Marks:
- Derive expression for current in an AC circuit containing only resistance.
- Phasor diagram for RC circuit.

3 Marks:
- Derive impedance and phase relation for LCR circuit.
- Power factor and its significance.

4 Marks (Case Study):
- Transformer working principle and energy loss analysis.

5 Marks:
- Derive expression for average power in an AC circuit.
- Resonance in LCR circuit explanation.