

GROUP A — Short Answer Questions (5 Marks Each)

1. What is electricity? Differentiate between static electricity and dynamic electricity with one example each.
 2. Define atom. Describe the structure of an atom with the help of a labeled diagram.
 3. What is electric charge? List any three properties of electric charge.
 4. State and explain Coulomb's Law. Write its mathematical formula and identify all terms.
 5. What is electric field? Define electric field strength (E) and write its formula.
 6. Define electric potential. What is meant by 1 volt? Write the formula for electric potential.
 7. What is potential difference? Explain how potential difference causes charge to flow.
 8. What is an electrostatic series? Explain with an example how it works when a plastic scale is rubbed against hair.
 9. Write short notes on: (a) Conservation of charge (b) Quantization of charge.
 10. Describe the contributions of any THREE scientists to the history of electricity. Include year and discovery for each.
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GROUP B — Long Answer Questions (8 Marks Each)

1. Explain the history of electricity from 1752 to 1890. Mention at least SIX key scientists or inventors, their years, and their contributions.
 2. Describe the structure of an atom in detail. Explain atomic number, atomic mass, and isotopes with examples. Also define electron, proton, and neutron with their charges and masses.
 3. State Coulomb's Law. Derive the formula $F = kQ_1 Q_2 / d^2$. Solve: Two charges of 4.8×10^{-19} C and 3.2×10^{-19} C are separated by 0.1 mm. Find the electrostatic force between them.
 4. Explain electric potential and potential difference in detail. Define voltage and electrical energy. Solve: An electron is in an electric field of intensity 5×10^{-12} N/C. Find the force experienced by the electron.
 5. What is electrostatics? Explain the concepts of electric field, electric field lines, and the behavior of charges at rest, at constant velocity, and at acceleration. Include diagrams where necessary.
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