

7.2 - Electric Potential

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- (1998) Describe and explain briefly a method for measuring the specific charge. Mention the errors expected in this method.
- (1999) Write down an expression for the forces on an electron when moving perpendicular to: an electric field
 - Write down an expression for the forces on an electron when moving perpendicular to: a magnetic field.
- (1999) An electron is moving in a uniform electric field of intensity $1.2 \times 10^5 \text{ Vm}^{-1}$. Find the acceleration of the electron.
- (2000) What is electric potential at a point in an electrostatic field?
- (2000) A proton of mass $1.673 \times 10^{-27} \text{ kg}$ falls through a distance of 1.5 cm in a uniform electric field of magnitude $2.0 \times 10^4 \text{ N C}^{-1}$. Determine the time of fall [Neglect g and air resistance.]
- (2007) What is the potential at the centre of the square of side 1.0 m, due to charges:
 - $q_1 = +1.0 \times 10^{-8} \text{ C}$, $q_2 = -2.0 \times 10^{-8} \text{ C}$, $q_3 = +3.0 \times 10^{-8} \text{ C}$, $q_4 = +2.0 \times 10^{-8} \text{ C}$
 - situated at the corners of the square?
- (2007) A charge Q is distributed over the concentric hollow spheres of radii r and R ($R > r$) such that the surface densities are the same. Calculate the potential at the common centre of the two spheres.
- (2010) Show that the path of an electron moving in an electric field is a parabola.
- (2013) Define electric potential.
- (2013) A radioactive source in the form of metallic sphere of radius 1.0 cm emits Beta particles at the rate of 5.0×10^{10} particles per second. If the source is electrically insulated, how long will it take for its electric potential to be raised by 2.0 V? (assuming that 40% of the emitted Beta-particles escape the source).
- (2013) A silver and copper voltmeter are connected in parallel across a 6 V battery of negligible internal resistance. In half an hour 1.0 g of copper and 2.0 g of silver are deposited. Calculate the rate at which the energy is supplied by the battery.
- (2015) Differentiate electric potential from electric potential difference.

- (2015) Sketch a graph of variation of electrical potential from the centre of a hollow charged conducting sphere of radius, r , up to infinity. Explain the shape of the graph.
- (2015) A square ABCD has each side of 100 cm. Four points charges of $+0.04 \mu\text{C}$, $-0.05 \mu\text{C}$, $+0.06 \mu\text{C}$, and $+0.05 \mu\text{C}$ are placed at A , B , C , and D respectively. Calculate the electric potential at the centre of the square.
- (2016) A proton of mass $16.7 \times 10^{-28} \text{ kg}$ falls through a distance of 2.5 cm in a uniform electric field of magnitude $2.65 \times 10^4 \text{ V/m}$. Determine the time of fall if the air resistance and the acceleration due to gravity, g , are neglected.
- (2017) Define the terms capacitance and electric potential.
- (2018) Why the emf of a cell is sometimes called a special terminal potential difference?
- (2019) What is the potential difference between two points if 5 Joules of work are required to move 10 Coulombs from one point to another?
- (2019) Define the terms electric potential and electric field-strength E at a point in the electrostatic field.
 - How the two quantities above related?
- (2019) Can there be a potential difference between two adjacent conductors carrying the same positive charge? Give a reason.