2019 Ph H1 Q11

Section: Particles and Waves

Topic: Forces on Charged Particles

Brief summary of the question

An alpha particle (q = 3.2×10^-19 C) gains K = 8.0×10^-16 J moving between plates P and Q. Find the potential difference V.

Worked solution

Kinetic energy gained = work done by electric field: K = qV.

V = K / q.

V = (8.0×10^-16) / (3.2×10^-19).

V = 2.5×10^3 V.

Final answer

D — 2.5×10^3 V.

Revision tips

- **Energy from an electric field: E = qV.**
- **Larger q ⇒ more energy gained for same V.**
- **Alpha particle charge = +2e.**