

5/6

H5 Force on Particle in a Magnetic Field

H5.1 Complete the questions in the table:

Charge /C	Speed /m s ⁻¹	Angle between velocity & B-field /°	Magnetic flux density /T	Force /N
6.0×10^{-9}	0.45	90	1.3	(a)
2.0×10^{-12}	31	30	0.000 56	(b)
2.0×10^{-17}	(c)	90	8.4	3.2×10^{-15}

H5.2 Calculate the force on an electron going at 3.5×10^7 m s⁻¹ in a 3.4 mT magnetic field:

- a) If the electron is travelling perpendicular to the magnetic field.
- b) If the electron is travelling parallel to the magnetic field.

H5.3 An electron is travelling at right angles to a magnetic field, and at right angles to an electric field such that the electric and magnetic forces cancel out. If the magnetic flux density is 0.043 T and the electric field is 330 kV m⁻¹, how fast is the electron going?