7(a)	• force per unit length • force per unit current • length / current perpendicular to field *1 mark for any two points, 2 marks for all three points.*
7(b)(i)	$F = BQv$
7(b)(ii)	arrow at Y pointing vertically upwards
7(b)(iii)	upwards deflection showing circular path
7(c)(i)	electric field applied vertically downwards (may be shown on a labelled diagram)
	electric force on particle in opposite direction to magnetic force (may be shown on a labelled diagram)
	particle undeflected when magnitudes of electric and magnetic forces are equal
7(c)(ii)	$EQ = BQv$
	$v = E / B$

6(a)(i)	$F = BIL$
	force on QR = $5.2 \times 10^{-3} \times 1.2 \times 0.054 \times 190$
	= 0.064 N
6(a)(ii)	torque = force × perpendicular distance between forces
	$= 0.064 \times 0.025 \cos\theta = (1.6 \times 10^{-3}) \cos\theta$ N m
6(a)(iii)	one complete cycle of a sinusoidal curve between 0 and 360°
	τ axis labelled to show maximum and minimum torques at $\pm\ 1.6 \times 10^{-3}$ N m
	maximum at 0 and 360° and minimum at 180° (or vice versa), with torque shown as zero at 90° and 270°
6(b)	(ferrous core) increases magnetic flux density
	amplitude of torque increases

6(a)	• force per unit length • force per unit current • length / current perpendicular to field *1 mark for any two points, 2 marks for all three points*
6(b)(i)	into the page
6(b)(ii)	$F = Bqv$
	$= 4.8 \times 10^{-3} \times 1.6 \times 10^{-19} \times 1.7 \times 10^{7} = 1.3 \times 10^{-14}$ N
6(b)(iii)	arrow at point X pointing down the page
6(b)(iv)	$F = mv^2 / r$
	$1.3 \times 10^{-14} = (9.11 \times 10^{-31}) \times (1.7 \times 10^{7})^2 / r$
	(r = 0.020 m) $d = 2r$ d = 0.040 m
6(c)	path shows upwards deflection such that the curvature is always anticlockwise within the field
	circular path with larger radius
	line enters field at X and leaves field at distance $2d$ vertically from X