6(a)	plate X marked as negative and plate Y marked as positive
6(b)(i)	$E = V / x$
	$= (58 \times 10^{3}) / 0.041$ $= 1.4 \times 10^{6}$ N C^{-1}
6(b)(ii)	$ma = eE$
	$a = (1.60 \times 10^{-19} \times 1.41 \times 10^{6}) / (9.11 \times 10^{-31})$ $= 2.5 \times 10^{17}$ m s^{-2}
6(c)(i)	$eV = hc / \lambda$ **or** $eV = hf$ **and** $f = c / \lambda$
	$(1.60 \times 10^{-19} \times 58 \times 10^{3}) = (6.63 \times 10^{-34} \times 3.00 \times 10^{8}) / \lambda$
	clear conversion from m to pm leading to $\lambda = 21$ pm
6(c)(ii)	X-rays
6(c)(iii)	*Any two points from:* • waves are passed into structure and transmitted waves detected • different parts of the structure absorb different fractions of energy • difference in detected / transmitted intensities used (to form image)

6(a)	$F_B = F_E$
	either: $Bqu = qE$ and $E = V / d$ leading to $u = V / Bd$ *or*: $Bqu = qV / d$ leading to $u = V / Bd$
6(b)	$E_K = \frac{1}{2}mu^2$
	$u = \sqrt{[(2 \times 4.1 \times 10^{-17}) / (3.2 \times 10^{-27})]}$ $= 1.6 \times 10^{5}$ ms^{-1}
	$B = 980 / (3.6 \times 10^{-2} \times 1.6 \times 10^{5})$ $= 0.17$ T
6(c)	expression is independent of mass and charge
6(d)	*either*: electric force is downwards so magnetic force is upwards *or*: no resultant force so magnetic force is upwards
	(positive ions so) current is from left to right
	from (Fleming's) left-hand rule, magnetic field is into the page
6(e)	curved path inside plates with consistent direction of curvature and with no discontinuity at entry or in curvature
	direction of deflection is upwards