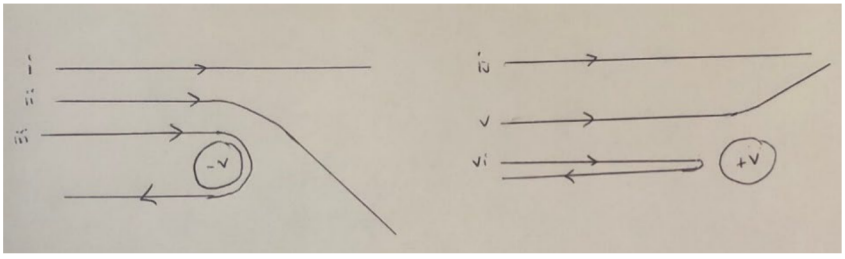
Question number	Answer		Mark
14(a)	• Only a few particles were deflected • So only a few came close enough to be deflected (so the charge must occupy a small volume)	1 1	(2)
14 (b)	 **Max 3** • Alpha particles close to a –ve nucleus would experience a force towards it and be deviated slightly (ii) • Alpha particles close to a +ve nucleus would experience a force away from it and be deviated slightly (v) • Alpha particles very close to a –ve nucleus would experience a force towards it and be deviated right around it and back again (iii) • Alpha particles approaching a +ve nucleus directly would experience a force away from it and be deviated right back again (vi) **And** • All of the possible observed paths can be explained by both types of nucleus, so the suggestion is correct	1 1 1 1 1	(4)
14 (c)	• Calculates E_K in J • Use of $V = kq_1/r$ **Or** $E_{pot} = kq_1q_2/r$ • $r = 3.6 \times 10^{-14}$ m Example of calculation $E_K = (6.29 \times 10^6)$ eV $\times 1.6 \times 10^{-19}$ C $= 1.01 \times 10^{-12}$ J 1.01×10^{-12} J $= 8.99 \times 10^9 \times 2 \times 1.6 \times 10^{-19}$ C $\times 78 \times 1.6 \times 10^{-19}$ C /r $r = 3.6 \times 10^{-14}$ m	1 1 1	(3)
	Total for question 14		9