18. Electric Fields

18.2 Uniform electric fields

Paper 4

Marking Scheme

Q1.

(b)(ii)	$E = V / d$	**C1**
	$E = 430 / 0.067$ $= 6.4 \times 10^3$ N C^{-1}	**A1**
(b)(iii)	smooth curve within plates and straight lines outside plates	**B1**
	direction of deflection shown as upwards	**B1**

Q2.

(c)(iii)	$E = V / d$	**C1**
	$mg = EQ$	**C1**
	mass $= (1200 \times 3.2 \times 10^{-19}) / (9.81 \times 0.052)$ $= 7.5 \times 10^{-16}$ kg	**A1**

Q3.

(b)(ii)	$E = V / d$	**C1**
	$= 2400 / 0.046$ $= 5.2 \times 10^4$ N C^{-1}	**A1**
(c)(i)	smooth curve in region of field and straight line outside field	**B1**
	direction of deflection shown as downwards in region of field	**B1**
(c)(ii)	helium nucleus has double the charge but four times the mass	**B1**
	velocity parallel to plates same and acceleration perpendicular to plates smaller (for helium)	**B1**
	final speed is lower (for helium)	**B1**