Question number	Answer	Mark
16 (a)	• Negative because the direction of field is direction of force on a positive charge **Or** Field downwards means negatively charged Earth and negative repels negative **Or** Negative because the force is in the opposite direction to the electric field (1)	**(1)**
16 (b)	• Use of $F = EQ$ (1) • Use of $W = mg$ (1) • $F - W$ to determine resultant force (1) • Use of $F = ma$ (1) • $a = 2.2$ m s^{-2} (1) Example of calculation $F = 120$ V m$^{-1} \times 3.00 \times 10^{-7}$ C $= 3.60 \times 10^{-5}$ N $W = 3.00 \times 10^{-6}$ kg $\times$ 9.81 N kg$^{-1} = 2.94 \times 10^{-5}$ N Resultant force $= 3.60 \times 10^{-5}$ N $- 2.94 \times 10^{-5}$ N $= 6.57 \times 10^{-6}$ N $a = 6.57 \times 10^{-6}$ N $\div 3.00 \times 10^{-6}$ kg $= 2.19$ m s^{-2}	**(5)**
16 (c)	• Use of $E = Q/4\pi\varepsilon_0 r^2$ **Or** Use of $E = kQ/r^2$ (1) • Use of $A = 4\pi r^2$ (1) • Charge $= 1.1 \times 10^{-9}$ C (m^{-2}) (1) Example of calculation $E = kQ/r^2$ 120 V m$^{-1} = 8.99 \times 10^9$ N m^2 C$^{-2} \times Q / (6.4 \times 10^6$ m$)^2$ $Q = 5.47 \times 10^5$ C $Q/A = 5.47 \times 10^5$ C $/ 4\pi \times (6.4 \times 10^6$ m$)^2$ $= 5.47 \times 10^5$ C $/ 5.15 \times 10^{14}$ m^2 $= 1.1 \times 10^{-9}$ C m^{-2}	**(3)**
	Total for question 16	**9**