Mark schemes

Q1.

(a) electrons are transferred to the student

1

(so) her hair is negatively charged

allow each hair has the same (negative) charge

1

(and) like charges repel

do not accept student being positively charged for MP1 and MP2

1

(b) the region (around a charged object) where another charged object experiences a force

allow space / area for region

allow particle for object

1

(c) (electric field strength) decreases

1

(d) $Q = 2 \times 10^{-6}$ (C)

1

$0.6 = 2 \times 10^{-6} \times V$

allow a correct substitution of an incorrectly / not converted value of Q

1

$$V = \frac{0.6}{2 \times 10^{-6}}$$

allow a correct rearrangement of an incorrectly / not converted value of Q

1

$V = 300\,000$ (V)

allow an answer consistent with an incorrectly / not converted value of Q

1

(e) decreased electrical resistance of air

1

[10]

Q2.

(a) electrons transferred from the cloth (to the rod)

1

electrons are negatively charged

this mark only scores if linked to the first marking point

1

(so) there are more positive charges than negative charges on the cloth

ignore more protons than electrons unqualified

1

any mention of transfer of positive charge scores 0

any mention of positive electrons scores 0

(b) there is an additional (downwards) force on the balance (increasing the mass reading)

1

(because) the (held) rod is negatively charged

allow both rods have the same (negative) charge

1

(and rods with) like charges repel
or
(and rods with) negative charges repel each other

1

(c) only the change in reading / mass is being observed

allow difference / increase for 'change in'

1

(d) the (large) potential difference between the two objects

allow (strong) electric field causes breakdown of air

do not accept earthed conductor is positively charged

1

(causes negative) electrons / charges to move (through the air)

allow there is a current in the air (between the two objects)

1

(from the rod) to the conductor

1

[10]