Name of the Student:_____
Max. Marks : 20 Marks **Time : 20 Minutes**

Mark Schemes

Q1.

(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]

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Q2.

(a) transformer **X** increases potential difference

1

and decreases current

do not accept if student states that potential difference decreases

1

reducing (thermal) energy transfer to surroundings

do not accept no energy transfer to surroundings

or

reducing (thermal) energy transfer from transmission cables

1

increasing the efficiency (of power transmission)

1

(b) transformer **Y** decreases the potential difference

1

to a safe / safer value

dependent on scoring 1st marking point

1

(c) $3.24 \times 10^{11} = Q \times 230$

1

$$Q = \frac{3.24 \times 10^{11}}{230}$$

1

Q = 1408 695 652 (C)

1

$Q = 1.41 \times 10^{9}$ (C)

or

Q = 1 410 000 000 (C)

allow correct rounding of an incorrect answer using data from the question

1

[10]

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