

# STATIC ELECTRICITY MARK SCHEME 1

## Question 1

Question	Answer	Extra Information	Mark
a)i)	clothing and seat rub together  electrons transfer from seat to driver or electrons transfer from driver to seat	accept friction between clothing and seat  accept electrons transfer on its own if  first mark scores an answer in terms of rubbing between clothing and seat and charge transfer without mention of electrons gains 1 mark an answer in terms of friction / rubbing and electron transfer without mention of clothing and seat gains 1 mark	1  1
b)i)	how wet the air is affects charge (build up) or damp air is a better conductor or damp air has a lower resistance	accept humidity affects charge  do not accept fair test or as a control unless explained	1

b)ii)	<p>No – it was only the lowest under these conditions or No – there are lots of other materials that were not tested or Yes – the highest value for cotton is smaller than the lowest value for the other materials</p>	<p>accept answer in terms of changing the conditions may change the results</p> <p>do not accept results show that it is always less / smallest</p>	1
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## Question 2

Question	Answer	Extra Information	Mark
a)	<p>soot /ash/ waste gases pass (negatively) charged grid soot/ash given a negative charge</p> <p>soot/ash repelled from (negative) grid or soot/ash attracted to (positively charged) metal plates</p>	accept picks up electrons	1 1  1
b)	<p>charge must increase / build up</p> <p>(producing) a large enough potential difference between dome and (earthed) conductor</p>	<p>accept electrons for charge any reference to positive electrons negates this mark accept voltage for pd any reference to positive</p>	1  1

		earth negates this mark	
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### Question 3

Question	Answer	Extra Information	Mark Schemes
a)i)	gained electrons		1
a)ii)	see if it exerts a force on another (charged) object or see if it will pick up (small) pieces of paper	accept repels another negative(ly charged)object accept attracts a positive(ly charged) object accept attracts or repels a charged object accept any correct way of showing an electrostatic effect i.e. bend a (slow moving) stream of water (from a tap) do not accept see if you get an electric shock on its own	1
b)i)	plastic is an insulator stop them discharging or stop them being earthed	accept plastic is a poor conductor any mention of heat negates this mark accept keeps the charge on the person accept stop them being grounded do not accept so don't get an electric shock accept electricity cannot go to earth	1 1

b)ii)	type of clothing could affect (build up of) charge/data	accept it is a variable/ factor (that needs to be controlled) do not accept fair test on its own	1
b)iii)	there is a clear pattern or enough precision to tell difference (between the materials) or accept none of the results are within 0.1kV of the shock line or each other	accept there is a wide range of results	1
b)iv)	any two from: ☐ the material normally used has a value above the p.d likely to cause a shock ☐ use a material that reduces pd (below 3.6 kV) ☐ so people are less likely to be shocked ☐ can put 'non-shock' seating in adverts ☐ may sell more seats/ cars	accept use a material that reduces charge (on the person) accept so people will not feel a shock  owtte	2

#### Question 4

Question	Answer	Extra Information	Mark

a)i)	droplets will repel each other even coating of glue/ sand (on the paper)	accept droplets will spread out	1 1
a)ii)	sand (becomes) positively charged repelled away from positive / lower plate	accept attract positively charged sand allow attracted to the (negatively) charged glue/ paper opposite charges attract does not score unless qualified	1 1
b)	0.002  coulombs	allow 1 mark for correct transformation and substitution accept C do not accept c accept 2mC or 2 milli coulombs for 3 marks	1  1