

# 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	accept humidity affects charge	1

	damp air is a better conductor or damp air has a lower resistance	do not accept fair test or as a control unless explained	
b)ii)	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	accept answer in terms of changing the conditions may change the results  do not accept results show that it is always less / smallest	1

## Question 2

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	1 1

		qualified	
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

### Question 3

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

	dome and (earthed) conductor	any reference to positive earth negates this mark	
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## Question 4

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	1 1

		<p>accept stop them being grounded do not accept so don't get an electric shock accept electricity cannot go to earth</p>	
b)ii)	<p>type of clothing could affect (build up of) charge/data</p>	<p>accept it is a variable/ factor (that needs to be controlled) do not accept fair test on its own</p>	1
b)iii)	<p>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</p>	<p>accept there is a wide range of results</p>	1
b)iv)	<p>any two from: <input type="checkbox"/> the material normally used has a value above the p.d likely to cause a shock <input type="checkbox"/> use a material that reduces pd (below 3.6 kV) <input type="checkbox"/> so people are less likely to be shocked</p>	<p>accept use a material that reduces charge (on the person) accept so people will not feel a shock  owtte</p>	2

	<ul style="list-style-type: none"><li>□ can put 'non-shock' seating in adverts</li><li>□ may sell more seats/ cars</li></ul>		
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