

1.

	answers	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
(ii)	sand (becomes) positively charged repelled away from positive / lower plate	accept attract <u>positively</u> 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	2  1

2.

question	answers	extra information	mark
(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	accept plastic is a poor conductor any mention of heat negates this mark	1
	stop them discharging or stop them being earthed	accept keeps the charge on the person accept stop them being grounded do <b>not</b> accept so don't get an electric shock accept electricity cannot go to earth	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 <b>not</b> 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

3.

question	answers	extra information	mark
(a)(i)	electrons transfer / removed	do <b>not</b> accept negatively charged atoms	1
	to the cloth / from the rod	this only scores if first mark given  accept negative charge transfer to the cloth / removed from rod for <b>1</b> mark  transfer of positive charge / positive electrons scores zero transfer of electrons to the rod scores zero	1
(a)(ii)	TV screen becomes (positively / negatively) charged	if the sign of the charge is given then must be opposites to score both marks do <b>not</b> accept TV screen becomes static	1
	<u>attracts</u> (negatively / positively charged) dust	correct answer in terms of induced charge gains full credit	1

(b)(i)	J O K P	3 marks for 4 correct 2 marks for 2 correct 1 mark for 1 correct	3
(b)(ii)	to melt the toner	accept to make the toner stick unless a reason is given that infers this is due to attraction of charged particles	1

4.

question	answers	extra information	mark
(a)	3 <sup>rd</sup> box  The negative charge in the water is repelled by the rod and the positive charge is attracted.		1
(b)(i)	friction between bottles and conveyor belt / (plastic) guides  charge transfers between bottles and conveyor belt / (plastic) guides	accept bottles rub against conveyor belt / (plastic) guides  accept specific reference eg electrons move onto / off the bottles  reference to positive electrons / protons negates this mark	1  1
(b)(ii)	an <u>atom</u> that has lost / gained <u>electron(s)</u>	do <b>not</b> accept a charged particle	1
(b)(iii)	charge will not (easily) flow off the conveyor belt	accept the conveyor belt / bottle is an insulator / not a conductor  accept conveyor belt is rubber	1