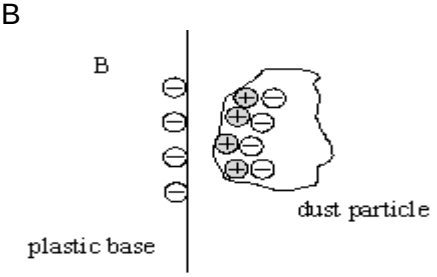
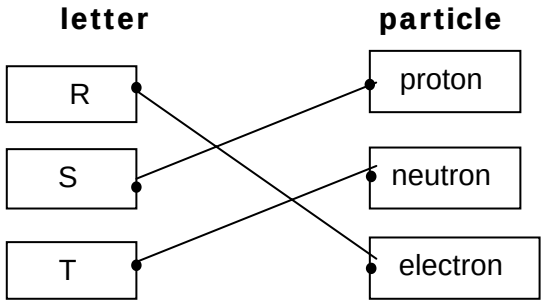
Question Number	Answer	Acceptable answers	Mark
1(a)(i)	B electrons		**(1)**

Question Number	Answer	Acceptable answers	Mark
1(a)(ii)	An explanation linking (negative) electrons transfer (1) because of friction/from cloth (to base) (1)	 negative charge (reject protons and positive charge for this mp) moves cloth loses {electrons/negative charge} (to base) = 2	**(2)**

Question Number	Answer	Acceptable answers	Mark
1(a)(iii)	A suggestion to include charge (any) could move through cup /metal (1) (cup is) earthed (1)	 cup/metal is a conductor ignore metal is not an insulator to {earth/ ground} / {to/ through} student's hand	**(2)**

Question Number	Answer	Acceptable answers	Mark
1(a)(iv)	B  		**(1)**

Question Number	Answer	Acceptable answers	Mark
1(b)	A description to include the situation which caused the charge separation (1) where the spark travelled {from or to}(1)	examples when refuelling, spark between end of {fuel/pipe} and vehicle =2 spark {between/from /to} person comb/clothes/metal handle and, when combing hair/removing clothing/opening door = 2 lightning flash, between cloud and cloud/plane/ground, =2 ignore between plug and socket/jump leads	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(a)	 Three lines correct 2 marks One / two correct 1 mark	if two lines from a box reject mark for that box	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(b)(i)	An explanation linking **one** of the following pairs **Either** • loss of a negative (1) • electron (1) **Or** • hair's repel (1) • (because) like charges repel (1)	Allow explanation linking any two electron rubbed off (hair) = 2 (hair) stands on end opposite charges on hair and comb attract = 1	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(b)(ii)	a conductor		**(1)**

Question Number	Answer	Acceptable answers	Mark
2(b)(iii)	An explanation linking **three** of the following points • paper is picked up (1) • charged objects attract uncharged (1) • charges separate on paper (1) • opposite charges attract (1) • weight is less than electrostatic force (1)	paper becomes positively charged paper is light	**(3)**

Question Number	Answer	Acceptable answers	Mark
3(a)(i)	positive / + /plus /+ve /positively (charged)	accept poor spelling of positive	**(1)**

Question Number	Answer	Acceptable answers	Mark
3(a)(ii)	An explanation linking **two** from the following points • repulsion / repels (1) • (because) same charge (1) • (force) greater than gravity (1)	independent mark positive charges repel each other (2) both positive so repel(2) positive ball attracted to negative lid (2)	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(b)	An explanation linking the following points • electrons move (1) • from ground to lid (1)	negative charge moves to neutralise positives	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(c)	An explanation linking the following points • discharged /earthed so falls(1) • charged again/at plate so rises/repels (1)	pulled down by gravity reached the plate and process repeats ignore direction of charge flow – already assessed	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(d)	**B**		**(1)**

Question Number	Answer	Acceptable answers	Mark
4(a)(i)	negative (1)		**(1)**

Question Number	Answer	Acceptable answers	Mark
4(a)(ii)	(much) smaller than a neutron (1)		**(1)**

Question Number	Answer	Acceptable answers	Mark
4(b)(i)	An explanation linking • (friction/it) produces charges (at the end of the pipe) (1) • charge jumps to fuel tank (1) • (charge/friction) causes a spark (1) • can cause a fire /explosion (1)	static (electricity) builds up	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(b)(ii)	An explanation linking • (excess) charge / electrons (1) • Removed/ conducts away (1)	static charge discharged/ neutralised discharge current scores both marks	**(2)**

Question Number		Indicative Content	Mark
QWC	*)	An explanation etc. including some of the following points • static electricity • opposites charges attract • charges are different • induced charges • charges separate • charges move • electrons move • electrons move towards a positive charge / balloon / rod Allow credit for a correct explanation for an effect which is not given in the question. Allow credit for separation of charge being shown on a diagram.	**(6)**
Level	**0**	No rewardable content	
1	**1 - 2**	• a limited explanation. Explains the effect is caused by charges. e.g. the charge on the balloon pulls the water; the charge on the rod attracts the bits of paper; the balloon is rubbed to give it charge; opposites attract; positive and negative attract; • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy	
2	**3 - 4**	• a simple explanation. Explains an effect is caused by opposite charges attracting or like charges repelling. e.g. the charge on the balloon is opposite to the charge on the water so they attract; the positive charges on the balloon attract negative charges on the girl's hair; • the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately • spelling, punctuation and grammar are used with some accuracy	
3	**5 - 6**	• a detailed explanation. Explains the effect is caused by induction, charge separation or moving electrons which leads to attraction between opposite charges. e.g. the electrons have been moved off the balloon so it has a positive charge and attracts the negative charge on the hair; the balloon has a positive charge and induces a negative charge on the stream of water which attracts it; • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors	

Total marks for question 6=12

Question Number	Answer	Acceptable answers	Mark
5(a)(i)	C		**(1)**

Question Number	Answer	Acceptable answers	Mark
5(a)(ii)	B		**(1)**

Question Number	Answer	Acceptable answers	Mark
5(b)	substitution (1) 3.7 x 13 evaluation (1) 48 (C)	48.1 Correct answer with no calculation scores 2 marks	**(2)**

Question Number	Answer	Acceptable answers	Mark
5(c)(i)	Correct responses can be seen in (i) r (ii) An explanation linking • <u>electrons</u> (1) and <u>one</u> of • removed by friction (1) • (transferred) <u>to</u> plastic (1)	["positive electrons/ protons moving", seen anywhere in part (i) or (ii) loses this mark] ignore reference to charge before rubbing transferred from cloth	**(2)**

Question Number	Answer	Acceptable answers	Mark
5(c)(ii)	opposite to charge on plastic (1) <u>equal</u> to charge on the plastic (1)	charge on cloth is positive <u>same size</u> as charge on plastic electrons transferred from the cloth equal to electrons lost by cloth	**(2)**

Total question 1 = 8 marks