

Question number	Answer	Notes	Marks
4 (a) (i)	A (friction); B is incorrect because gravity is not the force C is incorrect because magnetic is not the force D is incorrect because tension is not the force		1
(ii)	A (the rod gains electrons);		1
	B is incorrect because this would produce a positive charge		
	C is incorrect because protons are not transferred		
	D is incorrect because protons are not transferred		
(b) (i)	reading at -80 circled		1
(ii)	repeat or check that test or that result / ignore the result / idea of not including (that result) in the mean;	condone idea of “repeat the whole experiment”	1
(iii)	mean calculated including anomaly giving an answer that rounds to -67 = 1 mark max;		2
	mean calculated correctly ignoring anomaly i.e. -60 = 2 marks;;	allow ecf from (i) (-59+-61/2 =) -89.5 scores 1	
		(+)60 scores 1 (+)67 scores 0	

(iv)	<p>MP1 : suitable apparatus that would demonstrate rod is charged</p> <p>MP2: indication that a charged rod will apply a force on the 'other object'</p> <p>MP3: evidence that both attraction and repulsive forces will happen with opposite and like charges</p>	<p>reject response with references to magnets</p> <p>e.g. suspended second rod, hair, water stream, bits of paper, electroscope, coulombmeter</p> <p>e.g. (charged) rods attract, (charged) rods repel, water stream bends, hair attracts, electroscope foil deflects</p> <p>e.g. like charged rods will move away from each other but unlike charged rods will move together, condone gold leaf deflects one way with positive object then other way with negative object, coulombmeter shows positive with one test and negative with another</p>	3
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Total for Question 4 = 9 marks