1(a). Beth is doing some experiments with electricity.

She rubs a plastic rod with a cloth.

The rod becomes negatively charged.

Which statement explains how the rod gains the negative charge?

Put a tick (?) in the box next to the correct answer.

Electrons move from the cloth on to the rod. ☐

Electrons move from the rod on to the cloth. ☐

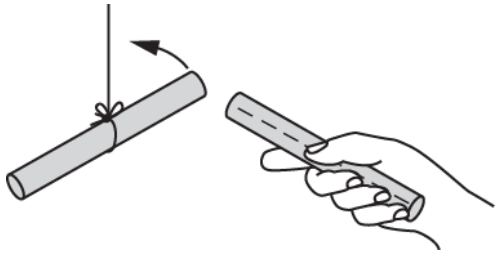
Molecules move from the cloth on to the rod. ☐

Molecules move from the rod on to the cloth. ☐

[1]

(b). Beth brings the negatively charged rod towards another rod that is hung from a string.

The rods **repel** each other.



(i) What is the charge on the rod that is hung from the string?

Draw **one** straight line from the correct **charge** to the **explanation**.

Charge	Explanation
negative	like charges repel
neutral	unlike charges attract
positive	

[1]

(ii) Beth thinks the charge on the rod she is holding will leak away because the rod is a conductor.

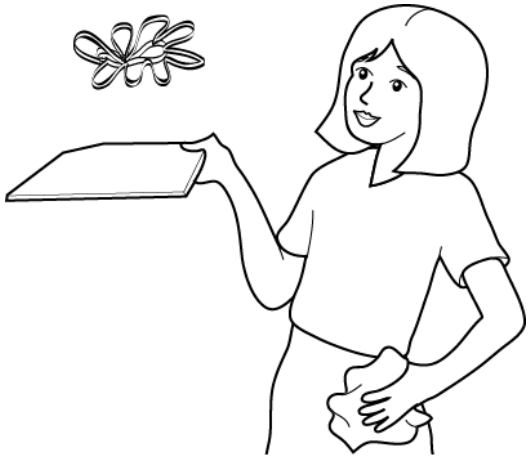
Is Beth correct?
Justify your answer.

---

[2]

2(a). Alice has a new toy.

It uses an electrostatic effect to make it 'fly'.



The toy has three parts: a plastic tray, a plastic 'flyer' and a cloth.

- She rubs the flyer with the cloth.
- She rubs the tray with the cloth.
- The flyer hovers above the tray.

Explain why rubbing the tray and the flyer makes the flyer hover above the tray.

---

[3]

(b). Static electricity is different from current electricity.

Complete the table to show whether each statement applies to **static electricity, current electricity** or **both.**

Put a tick (✓) in the one correct box in each row.

	Static electricity	Current electricity	Both
involves electrons			
involves a flow of charge			
requires a power supply or battery			
involves charged insulators			

[3]

END OF QUESTION PAPER

Question			Answer/Indicative content	Marks	Guidance
1	a		Electrons move from the cloth on to the rod. √ Electrons move from the rod on to the cloth. ☐ Molecules move from the cloth on to the rod. ☐ Molecules move from the rod on to the cloth. ☐	1	**Examiner's Comments** The vast majority of candidates knew the direction of movement of the electrons from the cloth to the rod.
	b	i	negative neutral positive like charges repel unlike charges attract	1	Must only be **ONE** line to gain mark **Examiner's Comments** Many candidates ignored the instruction to use one line to complete this question and as a result did not gain any marks.
		ii	Beth is wrong (no marks) charge does not leak away / charges do not move (1); rod is an insulator / not a conductor (1)	2	**Examiner's Comments** The candidates found this question tricky with many not realising that the rod was an insulator.
			Total	**4**	

<table>
<tr><th colspan="3">Question</th><th>Answer/Indicative content</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>2</td><td>a</td><td></td><td>any three from
rubbing the objects causes them to become charged (1)

electrons move from cloth to object (or other way around) (1)

tray and flyer must have the same charge (1)

so repel (each other) (1)</td><td>3</td><td>allow they become charged / they gain charge / become positive / become negative

Examiner's Comments

This question was about static electricity. Candidates were expected to recall and use ideas about charges to explain the movement of an electrostatic toy. Overall this question differentiated well. Most candidates were unable to access any marks for the explanation. The stronger candidates generally gained marks for ideas about the movement of electrons. The idea of the objects becoming charged or gaining charge was less well expressed. Similarly the ideas that both objects have the same charge and therefore repel were rarely seen.</td></tr>
<tr><td></td><td>b</td><td></td><td><table><tr><th></th><th>Static electricity</th><th>Current electricity</th><th>Both</th></tr><tr><td>involves electrons</td><td>(?)</td><td>(?)</td><td>?</td></tr><tr><td>involves a flow of charge</td><td></td><td>?</td><td></td></tr><tr><td>requires a power supply or battery</td><td></td><td>?</td><td></td></tr><tr><td>involves charged insulators</td><td>?</td><td></td><td></td></tr></table></td><td>3</td><td>4 rows correct: 3 marks
3 rows correct: 2 marks
2 rows correct: 1 mark

allow ticks in all three columns or both of the first two columns for involves electrons

Examiner's Comments

The objective question was generally well answered.</td></tr>
<tr><td></td><td></td><td></td><td>Total</td><td>6</td><td></td></tr>
</table>