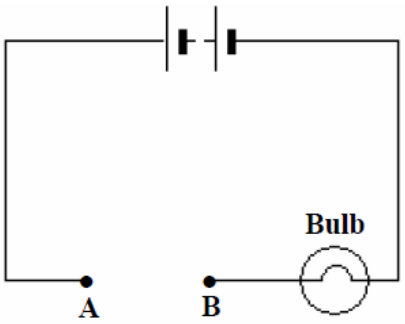
Physics: 13. Static Electricity

1.

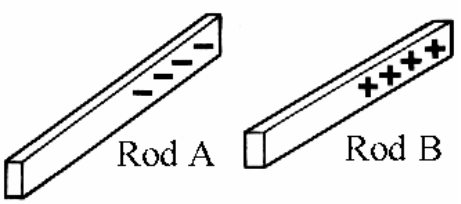
Exam Questions

1. [2006 OL]
A student set up the circuit drawn on the right to investigate different materials to see which were electrical conductors and which were electrical insulators.



(i) What would you expect to observe when an electrical conductor is connected between the contact points A and B? Give a reason for your answer.
(ii) What would you expect to observe when an electrical insulator is connected between the contact points A and B? Give a reason for your answer.

2. [2008]
Two rods A and B, made from different plastics, were given the static electrical charges shown in the diagram.
How could you have charged the rods as shown?



3. [2008]
Describe with the help of a labelled diagram how the force between the two charged rods A and B could be investigated.
What result would you expect from this investigation?

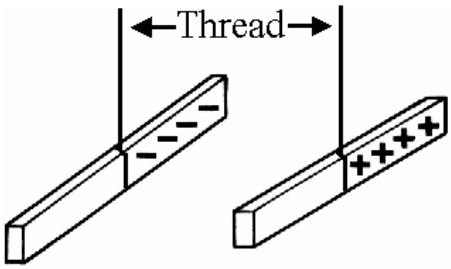
4. [2008]
In dry weather you can sometimes get an electric shock from a supermarket trolley.
This is caused by the build-up of static electricity on the trolley.
Explain clearly why this only happens in dry weather.
Answer
In wet weather moisture allows electric charge to escape.

5. [2009]
A plastic pen when rubbed with a dry cloth can attract small pieces of paper which 'stick' to it.
(i) Why does this happen?
(ii) Explain why the pieces of paper fall from the pen after some time.

6. [2006 OL]
The picture shows a flash of lightning.
(i) What type of energy generates lightning?
(ii) The flash of lightning is seen before the thunder is heard.
What does this tell us about the speed of light?

Exam Solutions

1.
(i) The bulb lights because there is a complete (closed) circuit.
(ii) The bulb doesn't light because the circuit is still broken (the material doesn't conduct)'
2. By rubbing them with a cloth
3. Suspend the rods as shown
Bring the rods close together
Result: The rods attract each other
OR
Balance one rod on a clock glass and bring the other rod up close to it.
Result: The rod balanced on the glass rotates towards the hand-held rod.
4. In wet weather moisture allows electric charge to escape.



5.
(i) Because the pen has charge
(ii) The pen loses its charge
6.
(i) Static electricity
(ii) Light travels faster than sound