

## **Gateway Science Physics A**

**J249/01 Physics A P1-P4 and P9 (Foundation Tier)**

### **Question Set 24**

A student rubs a balloon against a scarf.



- (a)\* Describe how the balloon becomes charged.  
Suggest how you could show that the balloon is charged.  
What would you expect to see and why?

[6]

- (b) Current is the rate of flow of electrical charge in a circuit.  
A current of 40 mA transfers a charge of 3.6 C.  
Calculate the time to transfer this charge.  
Show your working.

Answer = ..... seconds

[3]

**Total Marks for Question Set 24: 9**

## Equations in physics

$$(\text{final velocity})^2 - (\text{initial velocity})^2 = 2 \times \text{acceleration} \times \text{distance}$$

$$\text{change in thermal energy} = \text{mass} \times \text{specific heat capacity} \times \text{change in temperature}$$

$$\text{thermal energy for a change in state} = \text{mass} \times \text{specific latent heat}$$

$$\text{energy transferred in stretching} = 0.5 \times \text{spring constant} \times (\text{extension})^2$$

$$\text{potential difference across primary coil} \times \text{current in primary coil} = \text{potential difference across secondary coil} \times \text{current in secondary coil}$$

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