Oxford Cambridge and RSA

GCSE Physics A (Gateway)

J249/03 Physics A P1-P4 and P9 (Higher Tier)

Question Set 17

17 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 17: 9

Equations in physics

(final velocity)^2 – (initial velocity)^2 = 2 × acceleration × distance

change in thermal energy = mass × specific heat capacity × change in temperature

thermal energy for a change in state = mass × specific latent heat

energy transferred in stretching = 0.5 × spring constant × (extension)^2

potential difference across primary coil × current in primary coil = potential difference across secondary coil × current in secondary coil

Higher tier only –

force on a conductor (at right angles to a magnetic field) carrying a current = magnetic flux density × current × length