**12** (a) Photograph 1 shows part of an ammeter that can measure very small currents.


**Photograph 1**

A student moves a wire between the poles of a strong magnet and uses the ammeter to measure the induced current.

Determine the current reading shown by the ammeter in photograph 1.

**(1)**

current = ..... mA

(b) (i) Predict a value for the current if the movement of the wire was repeated with the poles of the magnet reversed.

**(1)**

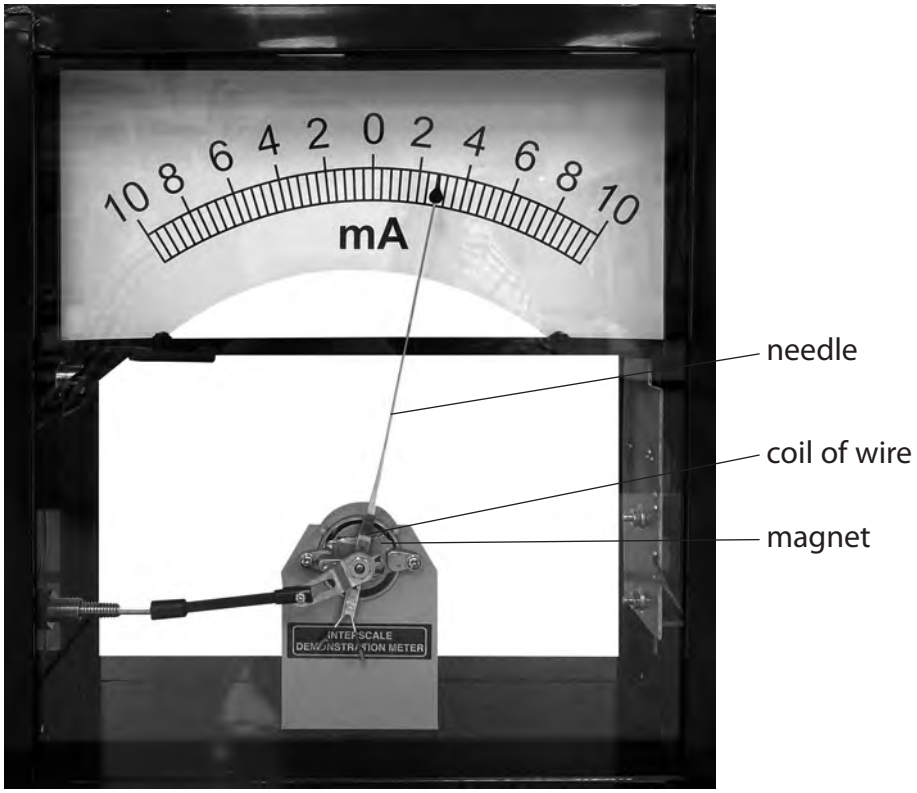
current = ..... mA

(ii) Predict a value for the current if the wire is moved faster between the poles of the magnet.

**(1)**

current = ..... mA

(c) Photograph 2 shows the structure of the ammeter.
The ammeter has a needle attached to a coil of wire which can move freely around a magnet.
When there is a current in the coil, the needle moves.
The larger the current, the more the coil turns.




**Photograph 2**

Suggest how the design of the ammeter could be modified to increase its sensitivity.

**(1)**

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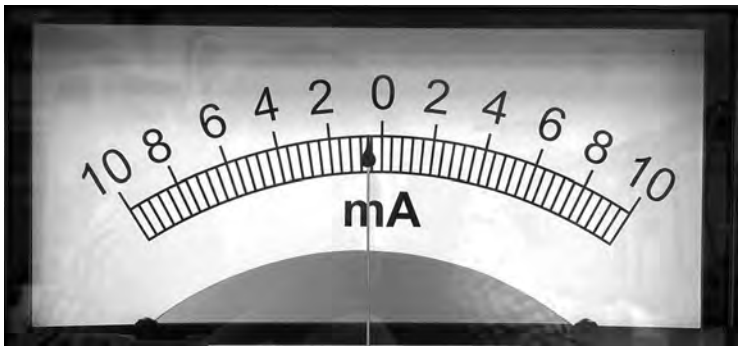
**QUESTION 12 CONTINUES ON NEXT PAGE**

(d) Photograph 3 shows part of the ammeter after a student has adjusted the ammeter in error.

The needle on the ammeter does not point to zero when there is no current.




**Photograph 3**

(i) Which of these factors has been decreased by the student's adjustment?

**(1)**

☒ **A** accuracy

☒ **B** precision

☒ **C** reliability

☒ **D** resolution

(ii) Suggest how the student could correct the readings taken from this ammeter due to this error without adjusting the ammeter.

**(1)**

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**(Total for Question 12 = 6 marks)**

**TOTAL FOR PAPER = 110 MARKS**