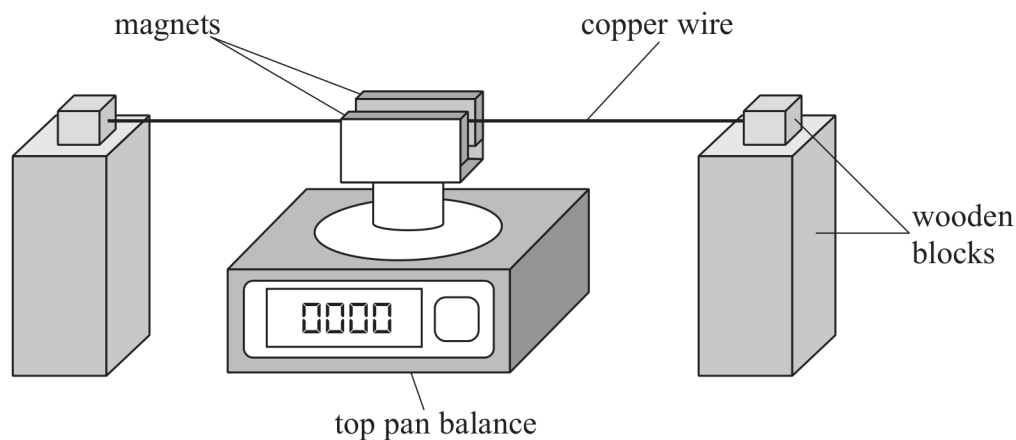


**Answer ALL questions.**

- 1 A student investigated the force on a current-carrying wire in a magnetic field. He used the apparatus shown.



The student connected the copper wire to a circuit which included a power supply with a fixed potential difference. The maximum current from the power supply was 5 A.

The student increased the current  $I$  in the copper wire. He recorded each corresponding reading  $m$  from the top pan balance.

- (a) Describe one safety issue and how it should be dealt with.

(2)

.....

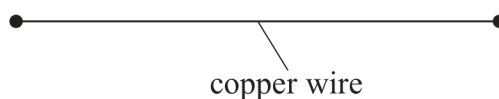
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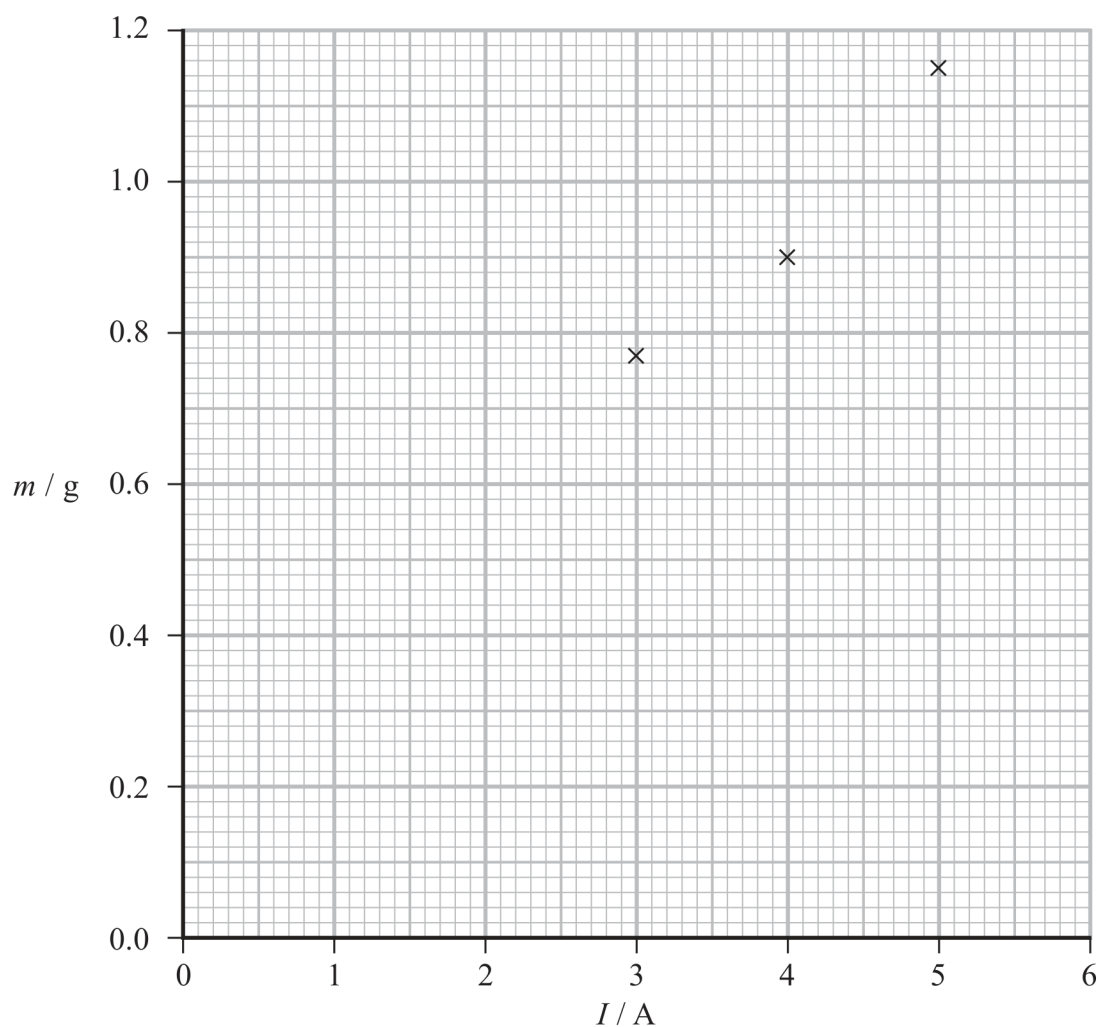
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- (b) Complete the circuit diagram for this investigation.

(2)



(c) The student plotted a graph of his readings as shown.



The relationship between  $m$  and  $I$  is given by

$$m = \left( \frac{BL}{g} \right) I$$

where

$B$  is the magnetic flux density between the magnets

$L$  is the length of the copper wire between the magnets.



The student concludes that his readings support the relationship.

Explain why the student's conclusion may not be correct.

Your answer should refer to the readings taken by the student.

(4)

DO NOT WRITE IN THIS AREA

THIS AREA

(Total for Question 1 = 8 marks)