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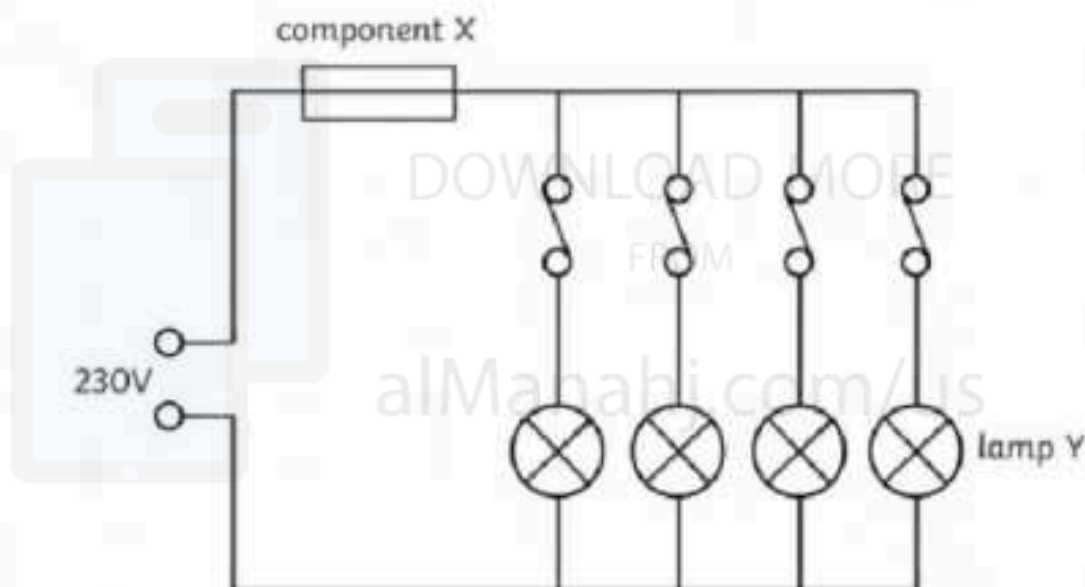


Science Year 9

Paper 2

Name: _____ Marks: _____ / 35

1. The diagram shows how the lights in a house are set up in the circuit.



(a) What is component X?

..... [1]

(b) Lamp Y was replaced by a low energy lamp which uses less power but provides the same amount of light. Which row of the table shows the right comparison of lamp Y to the low energy lamp?

Click on **one** box.

	Current in low energy lamp when compared to the current in the lamp Y	Voltage across low energy lamp when compared to the voltage across lamp Y
A	same as	less than
B	less than	same as
C	same as	same as
D	less than	less than

[1]

2. Which of the three spanners shown below would require the least effort (force applied) to turn the bolt?
Explain your answer.

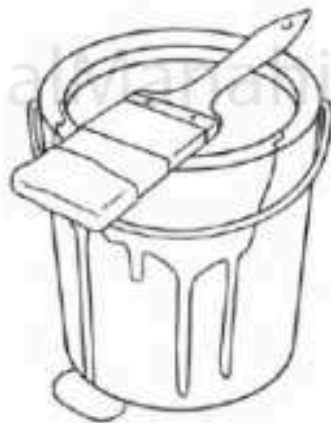
For
Teacher's
Use



.....

..... [2]

3. Joe is using a lever to try and open the lid on a tin of paint. The lid requires a moment of 3.5Nm to open it. He is able to exert a maximum force of 15N . What is the shortest length of lever he can use to open the paint tin.

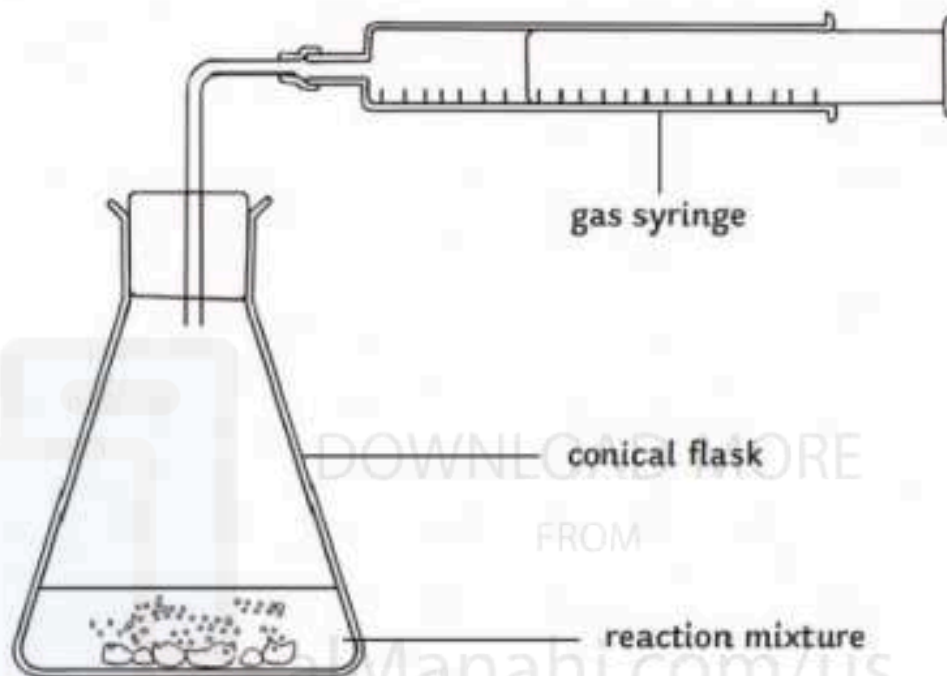


..... m [1]

4. Magnesium carbonate reacts with dilute hydrochloric acid.

Some students carried out an investigation of the reaction and collected the gas using a syringe.

The apparatus is shown in the diagram below.



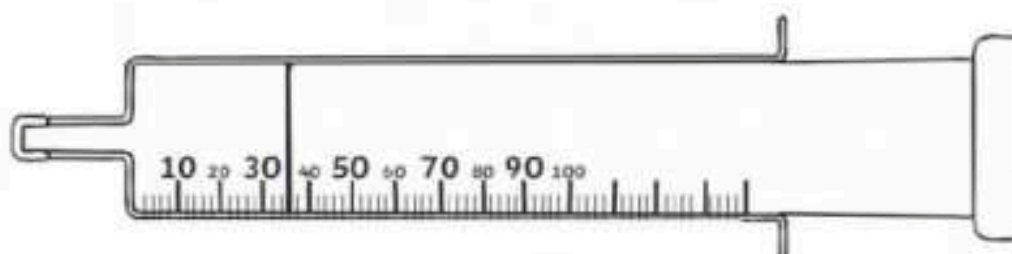
- (a) What gas are the students collecting?

..... [1]

- (b) Describe how the students could test for the gas they have collected in a lab.

.....
 [2]

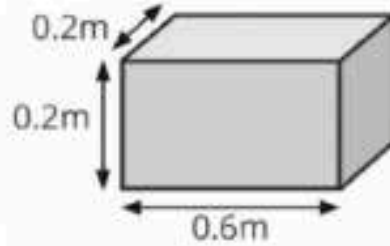
- (c) The diagram below shows the scale on the gas syringe.



What is the volume of collected gas in the syringe?

..... cm³ [2]

5. A block of oak wood has a mass of 18,480g. The dimensions of the block are shown below.



- (a) Calculate the volume of the block.

volume = m³ [2]

- (b) Calculate the density of the block.

density = kg/m³ [2]

6. Jack and James are identical twins.

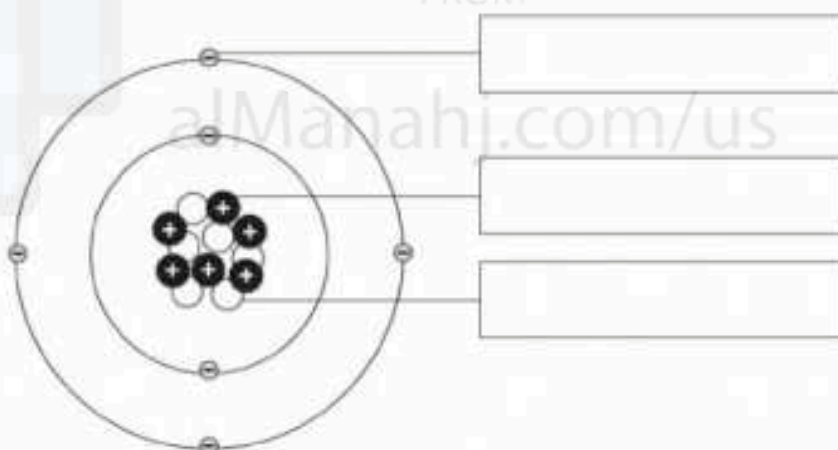


Explain why their hair colour is identical and yet there could be differences in their weight.

.....

..... [2]

7. The diagram shows the structure of an atom.



- (a) Choose answers from the box to complete the diagram above.

electron neutron proton

[3]

- (b) What is the overall charge of an atom?

Click on **one** box.

negative

neutral

positive

[1]

- (c) How does the number of protons in an atom compare to the number of electrons?

Click on **one** box.

Atoms have an equal number of protons and electrons

Atoms have more electrons than protons

Atoms have more protons than electrons

[1]

- (d) A student used a balloon to investigate static electricity. They rubbed the balloon against their hair and observed what happened. The outcome is shown in diagram below.



When the student rubbed the balloon against their hair, electrons were transferred from the hair to the balloon.

Complete the sentences to explain why the balloon caused the student's hair to stand on end.

Choose answers from the box.

negative	neutral
opposite	positive
	similar

- (i) The hair had a charge.
- (ii) The balloon had a charge.
- (iii) The hair was attracted to the balloon because charges attract.

[3]

8. A student investigated how the strength of an electromagnet is affected by changing the current through the electromagnet.

The equipment they used is show in diagram below.



power pack



insulated
copper wire



iron nail



crocodile
clips

- (a) When the electromagnet was switched on, paperclips were attracted to the electromagnet.

Explain why the paperclips were attracted to the electromagnet.

..... [1]

- (b) Complete the sentence to describe how changing the current affects the strength of an electromagnet.

Choose the answer from the box.

decrease	increases	stays the same
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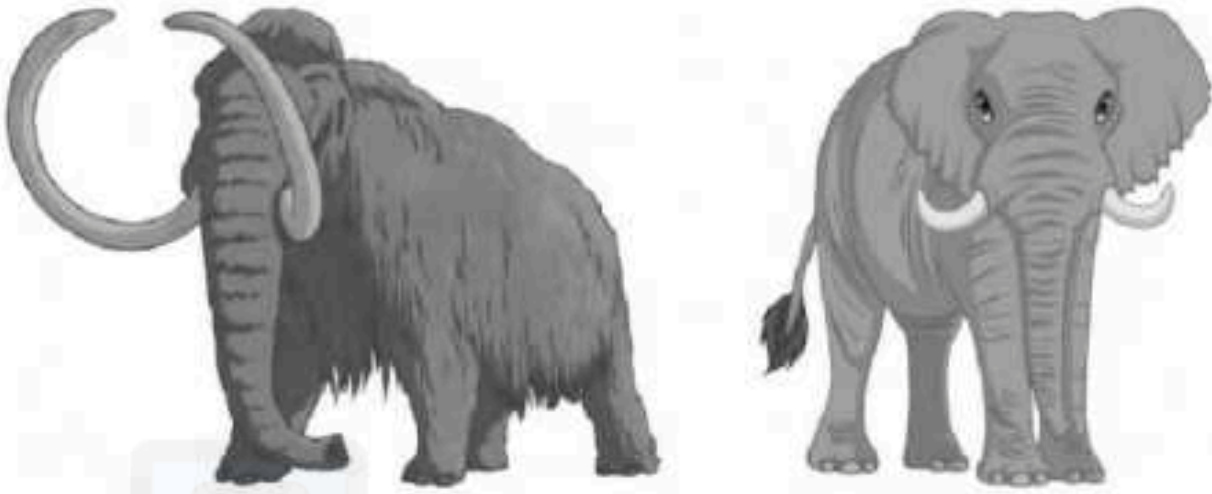
"As the current increases,

the strength of the electromagnet" [1]

- (c) Give one other way that the student could vary the strength of the electromagnet.

..... [1]

9. Below are images of a mammoth and an elephant. The mammoth and elephant are believed to be closely related.



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(a) State **two** reasons why scientists would believe them to be closely related.

1

2 [2]

(b) Mammoths are now extinct. What does extinct mean?

..... [1]

(c) Name **three** factors that might lead to extinction.

1

2

3 [2]

(d) Variation within a species can lead to evolution by natural selection.

Explain how.

.....

.....

..... [3]