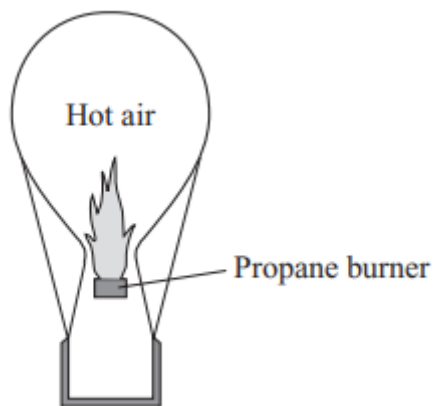


# ATOMS, ELEMENTS & COMPOUNDS 3

Q1. Hot air balloons burn hydrocarbons to heat the air.



(a) The hot air contains these gases: nitrogen,  $N_2$

oxygen,  $O_2$

argon, Ar

carbon dioxide,  $CO_2$

water vapour,  $H_2O$

(i) Argon is an element.

What is an element?

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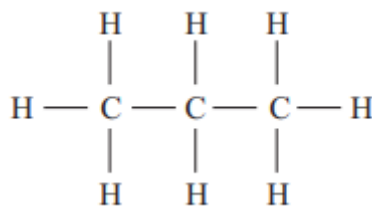
(1 mark)

(ii) Name one other gas in the hot air that is also an element.

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(1 mark)

(b) Propane,  $C_3H_8$ , can be represented as:



Use the correct words from the box to complete the sentences.

<b>bond</b>	<b>carbon</b>	<b>compound</b>	<b>element</b>	<b>mixture</b>
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(i) Propane is a ..... and is made up of atoms of hydrogen and .....  
(2 marks)

(ii) Each line between the atoms in propane represents a chemical .....  
(1 mark)

**Q2.** Limestone has been called the Earth's most useful rock.

(i) Limestone contains calcium carbonate,  $\text{CaCO}_3$ .

Complete the table to show the number of atoms of each element in the formula of calcium carbonate. Calcium has been done for you.

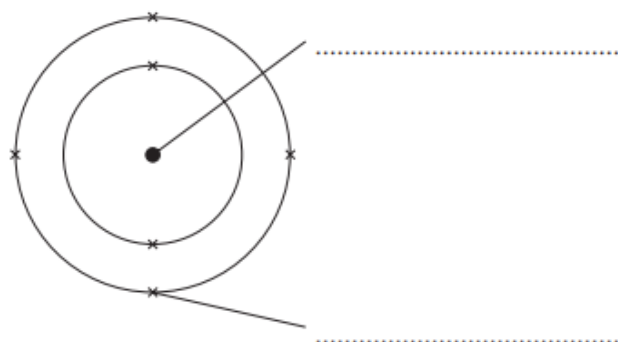
<b>Element</b>	<b>Number of atoms in the formula <math>\text{CaCO}_3</math></b>
<b>Calcium, Ca</b>	1
<b>Carbon, C</b>	
<b>Oxygen, O</b>	

(2 marks)

(ii) The diagram below represents a carbon atom.

Use words from the box to label the parts of this atom.

<b>bond</b>	<b>electron</b>	<b>molecule</b>	<b>nucleus</b>
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(2 marks)

Q3.

(a) In the diagrams below:

(N) is a nitrogen atom

(O) is an oxygen atom

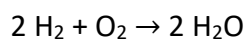
(C) is a carbon atom.

Draw one line from each diagram to its correct description. One line has been done for you.

Diagram	Description
	Compound
	Element
	Mixture
	Polymer

(2 marks)

(b) This chemical equation represents the reaction of hydrogen burning.



Complete the sentence to describe what is happening in this chemical reaction.

Hydrogen reacts with \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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(2 marks)

**Q4.**

**(a)** Complete the sentences.

**(i)** The atomic number of an atom is the number of \_\_\_\_\_.

(1 mark)

**(ii)** The mass number of an atom is the number of \_\_\_\_\_

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(1 mark)

**(b)** Explain why an atom has no overall charge. Use the relative electrical charges of sub-atomic particles in your explanation.

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(2 marks)

**Q5.** When elements react, their atoms join with other atoms to form compounds. Complete the sentences.

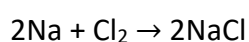
**(i)** Compounds formed when non-metals react with metals consist of particles called \_\_\_\_\_.

(1 mark)

**(ii)** Compounds formed from only non-metals consist of particles called \_\_\_\_\_.

(1 mark)

**Q6.** The chemical equation for a reaction of sodium is shown below.



Describe this reaction of sodium in terms of the names of the substances and the numbers of the atoms involved.

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(3 marks)

Total marks (22)