AQA Please write clearly in block capitals. Centre number Candidate number Surname Forename(s) Candidate signature

Level 3 Certificate/Extended Certificate APPLIED SCIENCE

Unit 1 Key Concepts in Science

Section B – Chemistry

Tuesday 22 January 2019 Mo

Morning

Materials

For this paper you must have:

- a calculator
- Periodic Table
- Formulae sheet.

Instructions

- Use black ink or black ball-point pen.
- Answer all questions in each section.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- You will be provided with a copy of the Formulae sheet and Periodic Table.
- There are three sections in this paper:
 - Section A Biology Section B Chemistry

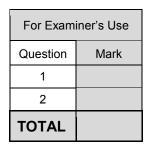
Section C – Physics.

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 60 and the maximum mark for this section is 20.

Advice

Read each question carefully.





Time allowed: 1 hour 30 minutes.

approximately 30 minutes on this

You are advised to spend

section.

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	Section B – Chemistry
	Answer all questions in this section.
0 1	Material scientists consider the properties of metals when selecting the best metal for a new product such as a metal container. Metals have a giant structure of regularly arranged neutral atoms.
01.1	Explain why atoms are always neutral. [2 marks]
01.2	Explain why all metals conduct electricity. [2 marks]
	Magnesium is not a suitable metal for making a metal container because it could
	react with the contents, which may be acidic.



0 1.4	Some metals are too soft to use to make a metal container unless mixed with elements to form an alloy. Brass is an alloy containing 95% copper and 5% a		Do not write outside the box
	Draw and label a diagram to show the arrangement of particles in brass.	2 marks]	
01.5	Suggest why brass is harder than pure copper.	[1 mark]	
01.6	Magnesium and strontium are both metals in Group 2 of the Periodic Table. Magnesium has a higher ionisation energy than strontium. Explain why.	[2 marks]	
			12



Turn over ►

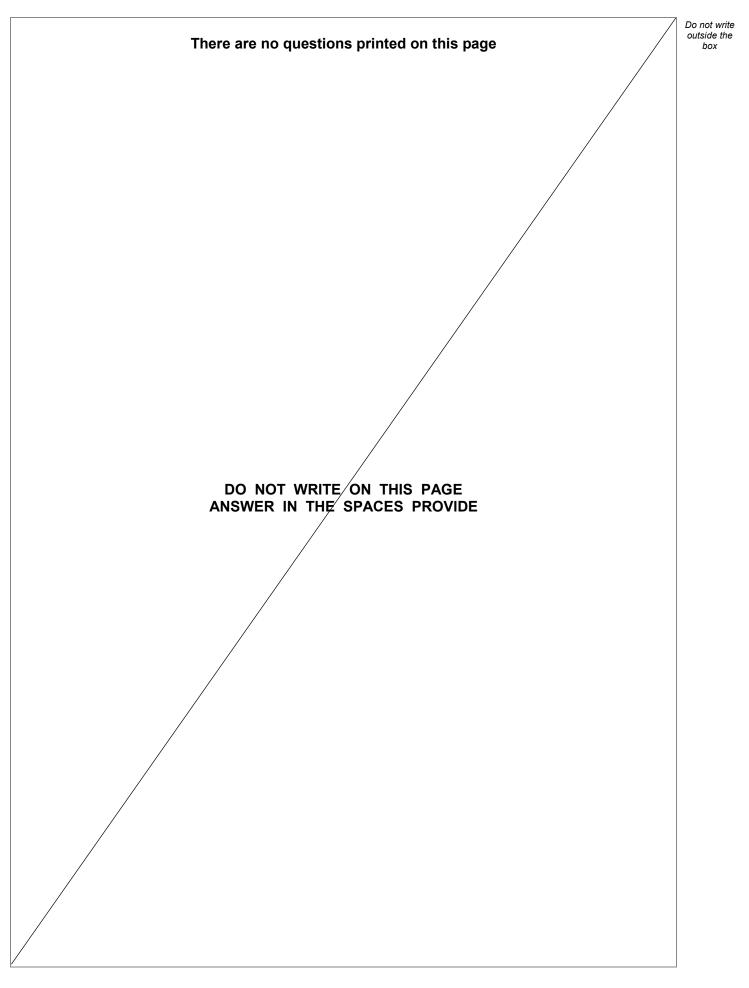
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02	The ideal gas equation can be used to determine the number of moles of particles in a gas at a particular temperature and pressure.
02.1	Calculate the number of moles of carbon dioxide in 4.00 \textrm{m}^3 of the gas at 150 kPa and 500 K.
	The gas constant, R = 8.31 JK ⁻¹ mol ⁻¹ [3 marks]
	Number of moles =
02.2	When heated, many metal carbonates produce a metal oxide and carbon dioxide.
	What is this type of reaction called?
	Tick (✓) one box.
	[1 mark]
	Oxidation
	Precipitation
	Reduction
	Thermal decomposition

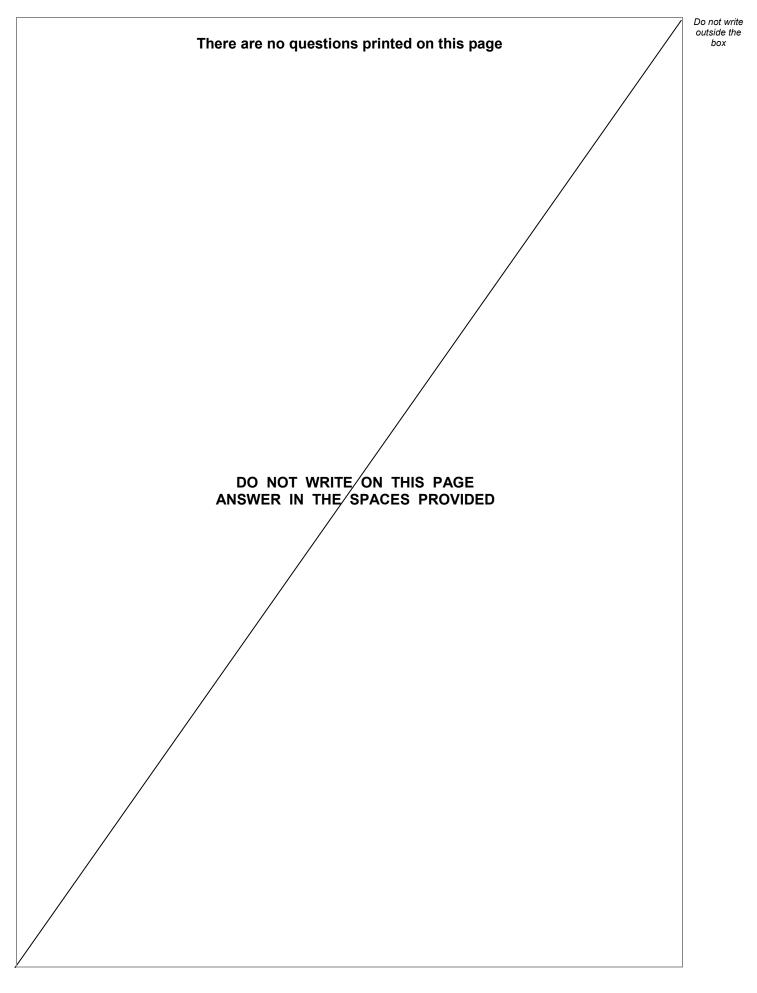


02.3	A sample of zinc carbonate, $ZnCO_3$, produces 27 moles of carbon dioxide.	Do not write outside the box
	$ZnCO_3 \rightarrow ZnO + CO_2$	
	Calculate the mass of carbon dioxide gas produced.	
	Include the unit in your answer. [2 marks]	
	Mass = Unit =	
02.4	The sample of zinc carbonate used in Question 02.3 should have produced 40 moles of carbon dioxide.	
	Suggest two reasons why less carbon dioxide was produced than expected. [2 marks]	
	1	
	2	
		8
	END OF QUESTIONS	











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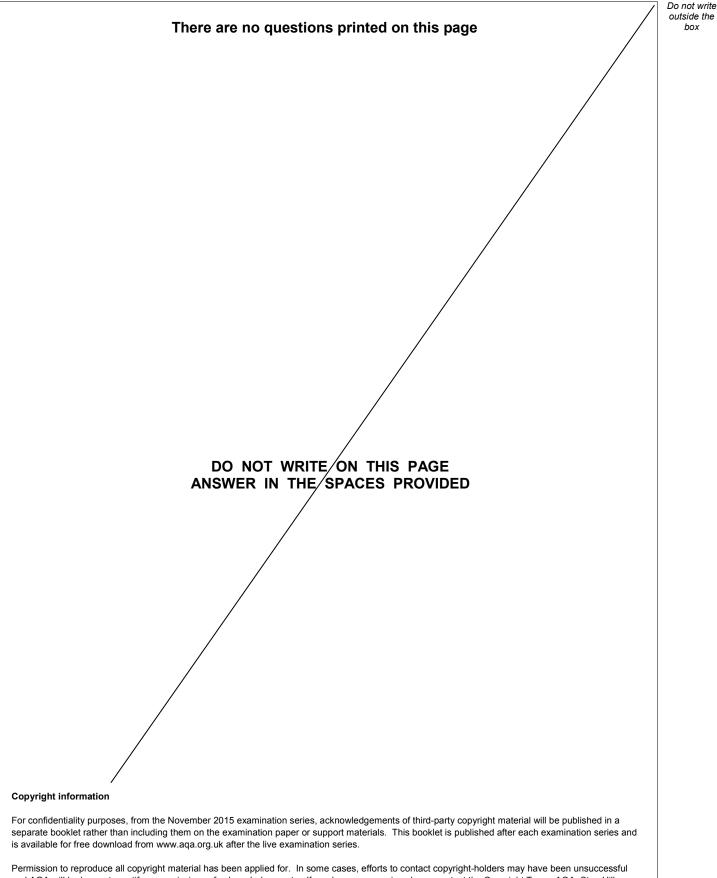


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