National Qualifications 2015

X713/75/02

Chemistry
Section 1—Questions

THURSDAY, 28 MAY

9:00 AM – 11:00 AM

Instructions for the completion of Section 1 are given on *Page two* of your question and answer booklet X713/75/01.

Record your answers on the answer grid on *Page three* of your question and answer booklet.

Necessary data will be found in the Chemistry Data Booklet for National 5.

Before leaving the examination room you must give your question and answer booklet to the Invigilator; if you do not, you may lose all the marks for this paper.

X7137502

SECTION 1

1. An atom has 26 protons, 26 electrons and 30 neutrons.

The atom has

A atomic number 26, mass number 56

B atomic number 56, mass number 30

C atomic number 30, mass number 26

D atomic number 52, mass number 56.

2. The table shows the numbers of protons, electrons and neutrons in four particles, **W**, **X**, **Y** and **Z**.

Particle	*Protons*	*Electrons*	*Neutrons*
W	17	17	18
X	11	11	12
Y	17	17	20
Z	18	18	18

Which pair of particles are isotopes?

A **W** and **X**

B **W** and **Y**

C **X** and **Y**

D **Y** and **Z**

3. Which of the following particles contains a different number of electrons from the others?

You may wish to use the data booklet to help you.

A Cl^-

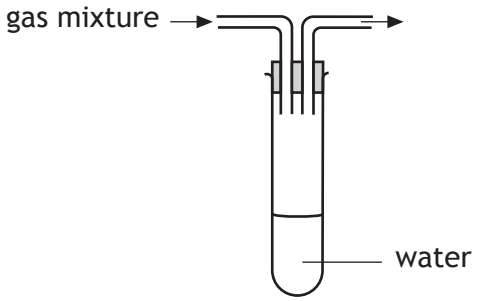
B S^{2-}

C Ar

D Na^+

4. Which of the following diagrams shows the apparatus which would allow a soluble gas to be removed from a mixture of gases?

A



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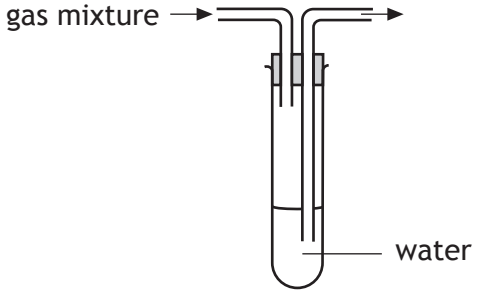

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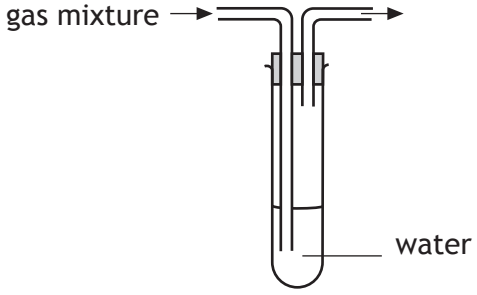

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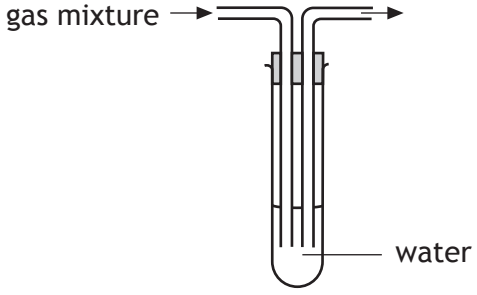
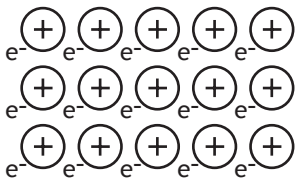


[Turn over

5. Which of the following diagrams could be used to represent the structure of a covalent network?

A



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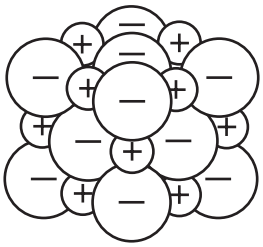

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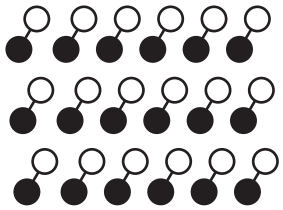

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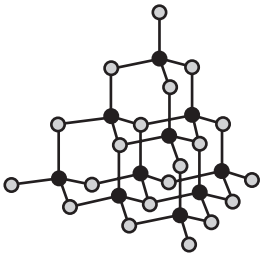


6. What is the charge on the chromium ion in $CrCl_3$?

A 1+

B 1−

C 3+

D 3−

7. The table contains information about calcium and calcium chloride.

	Melting point (°C)	*Density* ($g\,cm^{-3}$)
Calcium	842	1·54
Calcium chloride	772	2·15

When molten calcium chloride is electrolysed at 800 °C the calcium appears as a

A solid at the bottom of the molten calcium chloride

B liquid at the bottom of the molten calcium chloride

C solid on the surface of the molten calcium chloride

D liquid on the surface of the molten calcium chloride.

8. $\boldsymbol{x}\,Al(s) + \boldsymbol{y}\,Br_2(\ell) \rightarrow \boldsymbol{z}\,AlBr_3(s)$

This equation will be balanced when

A $\boldsymbol{x} = 1$, $\boldsymbol{y} = 2$ and $\boldsymbol{z} = 1$

B $\boldsymbol{x} = 2$, $\boldsymbol{y} = 3$ and $\boldsymbol{z} = 2$

C $\boldsymbol{x} = 3$, $\boldsymbol{y} = 2$ and $\boldsymbol{z} = 3$

D $\boldsymbol{x} = 4$, $\boldsymbol{y} = 3$ and $\boldsymbol{z} = 4$.

9. 0·2 mol of a gas has a mass of 12·8 g.

Which of the following could be the molecular formula for the gas?

A SO_2

B CO

C CO_2

D NH_3

[Turn over

10. Which of the following oxides, when shaken with water, would leave the pH unchanged? You may wish to use the data booklet to help you.

A Carbon dioxide

B Copper oxide

C Sodium oxide

D Sulfur dioxide

11. Which compound would **not** neutralise hydrochloric acid?

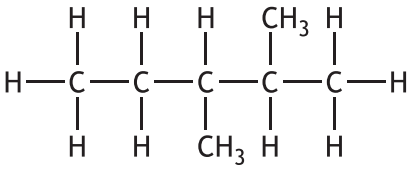
A Sodium carbonate

B Sodium chloride

C Sodium hydroxide

D Sodium oxide

12.



The name of the above compound is

A 2,3-dimethylpropane

B 3,4-dimethylpropane

C 2,3-dimethylpentane

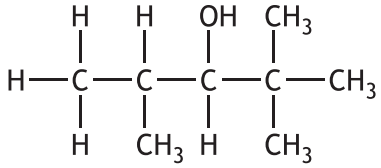
D 3,4-dimethylpentane.

13. The shortened structural formula for an organic compound is

$CH_3CH(CH_3)CH(OH)C(CH_3)_3$

Which of the following is another way of representing this structure?

A



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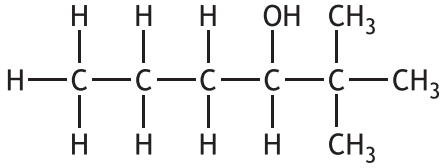

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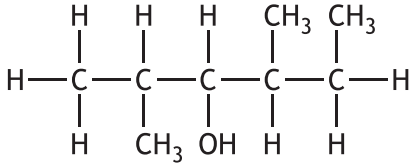

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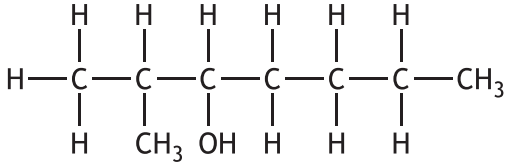

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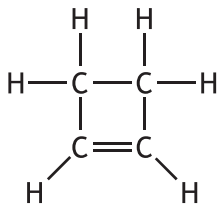
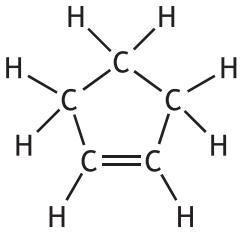
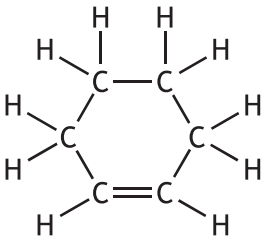
14. Three members of the cycloalkene homologous series are







Which of the following is the general formula for this homologous series?

A C_nH_{2n-4}

B C_nH_{2n+2}

C C_nH_{2n}

D C_nH_{2n-2}

15. Metallic bonding is a force of attraction between

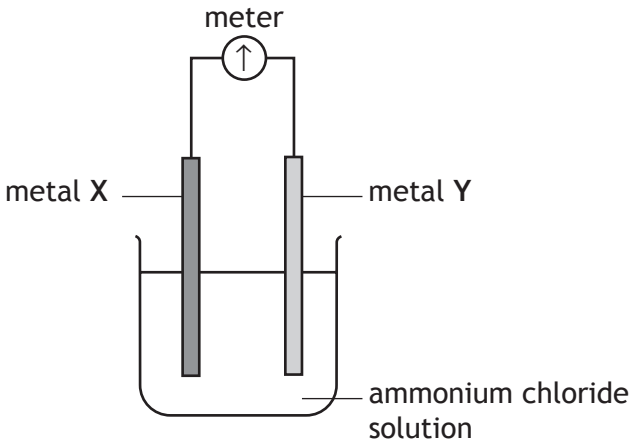
A negative ions and positive ions

B a shared pair of electrons and two nuclei

C positive ions and delocalised electrons

D negative ions and delocalised electrons.

16. Which pair of metals, when connected in a cell, would give the highest voltage and a flow of electrons from **X** to **Y**?

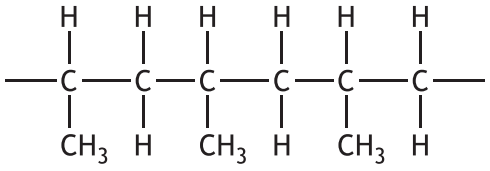


You may wish to use the data booklet to help you.

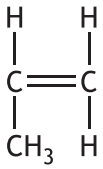
	Metal X	*Metal Y*
A	zinc	tin
B	tin	zinc
C	copper	magnesium
D	magnesium	copper

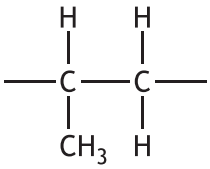
[Turn over

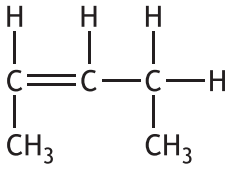
17. Part of the structure of a polymer is drawn below.

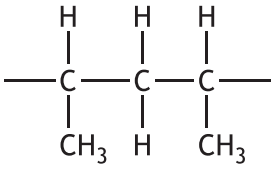


The monomer used to make this polymer is

A 

B 

C 

D 

18. Sodium sulfate solution reacts with barium chloride solution.

$$Na_2SO_4(aq) + BaCl_2(aq) \longrightarrow BaSO_4(s) + 2NaCl(aq)$$

The spectator ions present in this reaction are

A Na^+ and Cl^-

B Na^+ and SO_4^{2-}

C Ba^{2+} and Cl^-

D Ba^{2+} and SO_4^{2-}.

19. Which of the following solutions would produce a precipitate when mixed together? You may wish to use the data booklet to help you.

A Ammonium chloride and potassium nitrate

B Zinc nitrate and magnesium sulfate

C Calcium nitrate and nickel chloride

D Sodium iodide and silver nitrate

[Turn over for Question 20 on *Page twelve*

20. The table shows the colours of some ionic compounds in solution.

Compound	*Colour*
copper sulfate	blue
copper chromate	green
potassium chloride	colourless
potassium chromate	yellow

The colour of the chromate ion is

A blue

B green

C colourless

D yellow.

[END OF SECTION 1. NOW ATTEMPT THE QUESTIONS IN SECTION 2 OF YOUR QUESTION AND ANSWER BOOKLET]