Questions

Q1.

Some questions must be answered with a cross in a box (☒). If you change your mind about an answer, put a line through the box (☒) and then mark your new answer with a cross (☒).

The structure of one molecule of a compound is shown in Figure 10.

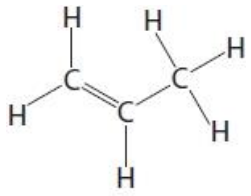


Figure 10

What is the molecular formula of the compound in Figure 10?

(1)

- ☐ **A** CH
- ☐ **B** CH_2
- ☐ **C** $3C_6H$
- ☐ **D** C_3H_6

(Total for question = 1 mark)

Q2.

Some questions must be answered with a cross in a box (☒). If you change your mind about an answer, put a line through the box (☒) and then mark your new answer with a cross (☒).

Figure 1 shows toothbrushes in a container.

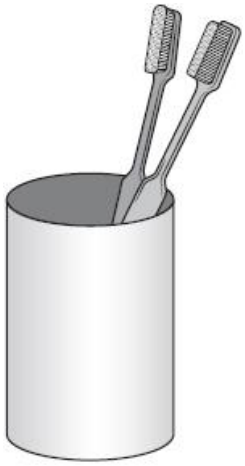


Figure 1

The container is made of a ceramic material.

Which is a property of the ceramic that makes it suitable for the container?

(1)

- ☒ **A** it will break if dropped
- ☒ **B** it does not react with water
- ☒ **C** it melts at over 2 000 °C
- ☒ **D** it is a good conductor of heat

(Total for question = 1 mark)

Q3.

Figure 1 shows a mug made of clay ceramic.

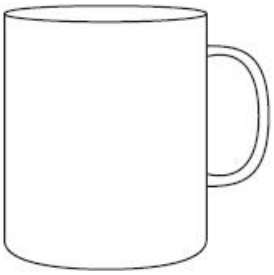


Figure 1

Which property of clay ceramic makes it suitable for use as a mug?

(1)

- ☒ **A** is brittle
- ☒ **B** is not transparent
- ☒ **C** does not conduct electricity
- ☒ **D** does not dissolve in water

(Total for question = 1 mark)

Q4.

Some questions must be answered with a cross in a box (☒). If you change your mind about an answer, put a line through the box (☒) and then mark your new answer with a cross (☒).

Figure 1 shows toothbrushes in a container.

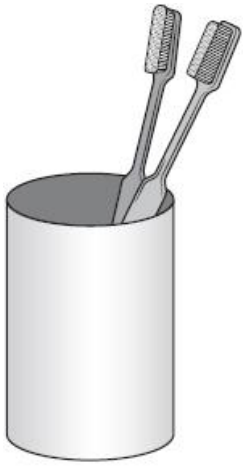


Figure 1

In some countries, toothpastes contain nanoparticles of silver.

Which statement describes the size of a nanoparticle?

(1)

- ☒ **A** the size of an electron
- ☒ **B** the size of an atom
- ☒ **C** the size of a few hundred atoms
- ☒ **D** the size of 1 million molecules

(Total for question = 1 mark)

Q5.

Butene reacts with steam to produce butanol.

$$C_4H_8 + H_2O \rightarrow C_4H_9OH$$

What type of reaction takes place between butene and steam?

(1)

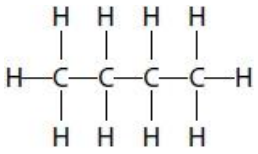
- ☒ **A** addition
- ☒ **B** dehydration
- ☒ **C** neutralisation
- ☒ **D** substitution

(Total for question = 1 mark)

Q6.

Alkanes and alkenes are hydrocarbons.

The structure of a molecule of butane is shown.



Which of the following is the empirical formula for butane?

(1)

- ☒ **A** CH
- ☒ **B** CH_2
- ☒ **C** C_2H_5
- ☒ **D** C_4H_{10}

(Total for question = 1 mark)

Q7.

Polymer molecules can be made by joining together large numbers of small molecules called monomers.

A molecule of propene has the structure shown in Figure 6.

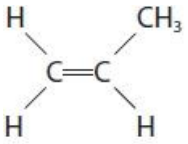
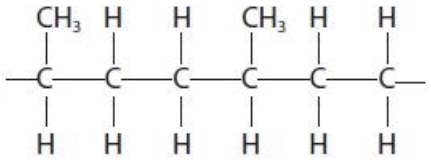


Figure 6

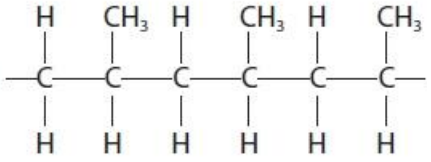
Which of the following shows the structure of part of a poly(propene) molecule?

(1)

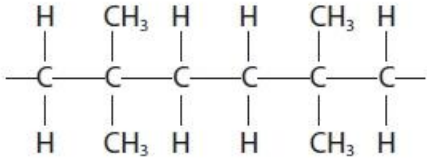
☒ **A**



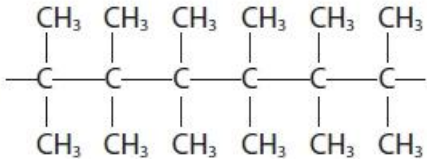
☒ **B**



☒ **C**



☒ **D**



(Total for question = 1 mark)

Q8.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

A chloride ion, a fluorine atom and a nanoparticle are all types of particle.
Which of the following shows the particles in order of size, starting from the smallest?

(1)

- ☐ **A** nanoparticle, fluorine atom, chloride ion
- ☐ **B** nanoparticle, chloride ion, fluorine atom
- ☐ **C** fluorine atom, nanoparticle, chloride ion
- ☐ **D** fluorine atom, chloride ion, nanoparticle

(Total for question = 1 mark)

Q9.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Ethanol can be produced by the fermentation of glucose solution.

Which of these shows the word equation for the fermentation of glucose solution?

(1)

- ☐ **A** glucose → ethanol + water
- ☐ **B** glucose → ethanol + carbon dioxide
- ☐ **C** glucose → ethanol + hydrogen
- ☐ **D** glucose → ethanol + water + carbon dioxide

(Total for question = 1 mark)

Q10.

Figure 3 shows two tests carried out on a white solid and the results of the tests.

	test	results
test 1	flame test carried out	a yellow flame
test 2	dilute hydrochloric acid added gas given off passed into limewater	effervescence occurs the limewater goes milky

Figure 3

Which ion is shown to be present by the result of test 1?

(1)

- ☒ **A** lithium
- ☒ **B** sodium
- ☒ **C** potassium
- ☒ **D** calcium

(Total for question = 1 mark)

Q11.

Figure 10 shows information about a glass, a ceramic, a polymer and a metal.

	glass	ceramic	polymer	metal
flexibility	low	low	high	high
hardness	medium	medium	low	low
reaction with water	no reaction	no reaction	no reaction	very slow reaction
electrical conductivity	low	low	low	high
melting point	high	high	medium*	high

*polymers soften, rather than melt, when heated.

Figure 10

Figure 11 shows part of a household wire that connects a kettle to a plug.

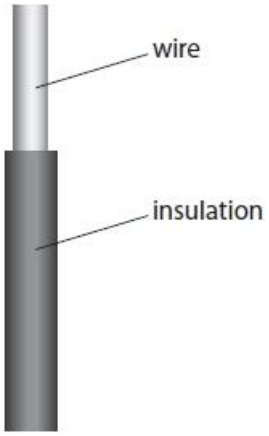


Figure 11

(i) Why is this wire made of metal?

(1)

- ☒ **A** the metal is hard
- ☒ **B** the metal reacts with water
- ☒ **C** the metal is an element
- ☒ **D** the metal conducts electricity

(ii) Which type of material would be most suitable for the insulation on this household wire?

(1)

- ☒ **A** the glass
- ☒ **B** the ceramic
- ☒ **C** the polymer
- ☒ **D** the metal

(Total for question = 2 marks)

Q12.

The test for chloride ions was carried out on a solution.
Dilute nitric acid was added to the solution, followed by a few drops of silver nitrate solution.
A white precipitate formed.

Why is it necessary to add dilute nitric acid in this test?

(1)

- ☒ **A** To neutralise the solution
- ☒ **B** Nitrate ions are needed for the test to work
- ☒ **C** To make sure that no carbonate ions are present
- ☒ **D** The test only works in alkaline conditions

(Total for question = 1 mark)

Q13.

Some polymers are polyesters.

What type of reaction takes place when polyesters are formed?

(1)

- ☒ **A** addition
- ☒ **B** condensation
- ☒ **C** neutralisation
- ☒ **D** precipitation

(Total for question = 1 mark)

Mark Scheme

Q1.

Question number	Answer	Mark
	D C_3H_6 is the only correct answer **A, B** and **C** are incorrect formula	**(1)** **AO2 1**

Q2.

Question number	Answer	Mark
	B it does not react with water is the only correct answer **A, C** are not correct because they are not useful **D** is an incorrect statement	**(1)** **AO1 1**

Q3.

Question number	Answer	Mark
	D does not dissolve in water **A, B** and **C** are not factually correct	**(1)** **AO2**

Q4.

Question number	Answer	Mark
	C the size of a few hundred atoms is the only correct answer **A** and **B** are incorrect because nanoparticles are made of more than one atom **D** is incorrect as there are too many molecules	**(1)** **AO1 1**

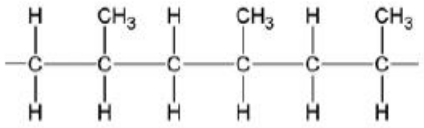
Q5.

Question number	Answer	Mark
	A	(1)

Q6.

Question number	Answer	Mark
	C	(1)

Q7.

Question number	Answer	Mark
	B  is the only correct answer **A** is not correct because there are insufficient CH_3 groups attached to the carbon chain **C** is not correct because only one CH_3 group can be attached to a carbon atom **D** is not correct because there are no H atoms attached to the carbon chain	(1)

Q8.

Question number	Answer	Mark
	D fluorine atom, chloride ion, nanoparticle is the only correct answer. **A** and **B** are not correct because the smallest particle is the atom **C** is not correct because the largest particle is the nanoparticle	(1)

Q9.

Question number	Answer	Mark
	B glucose → ethanol + carbon dioxide **B** is the only correct answer. **A** is incorrect because water is not produced **C** is incorrect because hydrogen is not produced **D** is incorrect because water is not produced	**(1)**

Q10.

Question Number	Answer	Mark
	B sodium **The only correct answer is B** ***A*** *is not correct because lithium gives red flame* ***C*** *is not correct because potassium gives lilac flame* ***D*** *is not correct because calcium gives red-orange flame*	**(1)** AO 1 1

Q11.

Question Number	Answer	Mark
(i)	**D** the metal conducts electricity **The only correct answer is D** ***A*** *is not correct because metals are not hard* ***B*** *is not correct because this is not useful* ***C*** *is not correct because this is not relevant*	**(1)** AO 2 1

Question Number	Answer	Mark
(ii)	**C** the polymer **The only correct answer is C** ***A*** *is not correct because this in not flexible* ***B*** *is not correct because this is not flexible* ***D*** *is not correct because this is a conductor*	**(1)** AO 3 1a

Q12.

Question number	Answer	Mark
	C	**(1)**

Q13.

Question Number	Answer	Mark
	B condensation **The only correct answer is B** ***A*** *is not correct because this is not an addition reaction* ***C*** *is not correct because this is not a neutralisation reaction* ***D*** *is not correct because this is not a precipitation reaction*	**(1)** AO 1 1