

**Section B**

Answer any **two** questions in this section.

Write your answers in the spaces provided.

- 9** Fluorine is an element found in Group VII. It would react vigorously with potassium, from Group I, to form potassium fluoride. It would also react with hydrogen gas to form hydrogen fluoride.

**(a)** Write a balanced chemical equation for the reaction of fluorine and potassium.

.....[2]

**(b)** Draw and label the electronic structures of potassium fluoride and hydrogen fluoride.

[Proton (atomic) numbers: H, 1 ;F, 9; K, 19]

potassium fluoride

hydrogen fluoride

[4]

**(c)** Use these structures to explain why, at room temperature and pressure, potassium fluoride is a solid and hydrogen fluoride is a gas.

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 .....  
 .....  
 .....  
 .....[4]

10 Alcohols form a homologous series.

(a) (i) Give **two** general properties of a homologous series.

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 .....  
 .....[2]

(ii) Write the general formula of the homologous series of alcohols.

.....[1]

(b) **X** is an alcohol with two carbon atoms in its molecule.

(i) Complete Table 10.1 by naming and drawing the full structural formula of **X**.

**Table 10.1**

name of <b>X</b>	structural formula of <b>X</b>

[2]

(ii) Give the chemical formula of the organic substance that is formed when **X** reacts with atmospheric oxygen.

.....[1]

(iii) A solution of **X** can be made by fermentation of glucose. Describe how this process is completed in the laboratory.

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 .....  
 .....  
 .....[3]

(iv) **X** is commonly used in Brazil as a fuel for vehicles. Suggest a reason why **X** can be used for this purpose.

.....[1]

11 When hydrochloric acid reacts with strips of magnesium, a gas is given off.

- (a) Draw a diagram to show how you would investigate the speed of the reaction between hydrochloric acid and magnesium in an experiment. Describe how you would find the speed of the reaction based on the data collected in this experiment.

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 .....[4]

- (b) State and explain **one** way of increasing the speed of this reaction. Use your knowledge of reacting particles in your explanations.

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 .....  
 .....  
 .....[3]

- (c) Give the name of the gas given off in this reaction.

.....[1]

- (d) **G** is the next member in the same group that magnesium belongs to.

- (i) State the chemical symbol of **G**.

.....[1]

- (ii) Explain why **G** is placed in the same group as magnesium.

.....[1]