Q1. This question is about organic compounds.

(a) Ethanol burns in air.

Use the correct answer from the box to complete the word equation for the reaction.

carbon	hydrogen	oxygen

ethanol + ... → carbon dioxide + water

(1)

(b) Use the correct answer from the box to complete the sentence.

milk	hard water	vinegar

Ethanoic acid is in ..... .

(1)

(c) Ethanoic acid is a carboxylic acid.

Which diagram, **A, B** or **C**, has a ring around the functional group of a carboxylic acid?

Write your answer in the box.

Diagram A

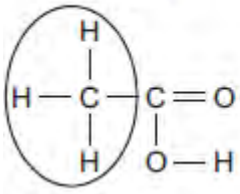

Diagram B

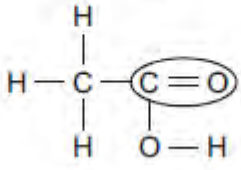

Diagram C

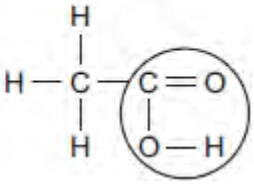

Diagram ☐

(1)

(d) Ethyl propanoate is produced by reacting ethanol with propanoic acid.

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What type of organic compound is ethyl propanoate?

Tick (✓) **one** box.

Alcohol ☐

Carboxylic acid ☐

Ester ☐

(1)

(e) Organic compounds such as ethyl propanoate are used in perfumes.

Give **two** properties of these compounds that make them suitable for use in perfumes.

.....

.....

(2)
(Total 6 marks)

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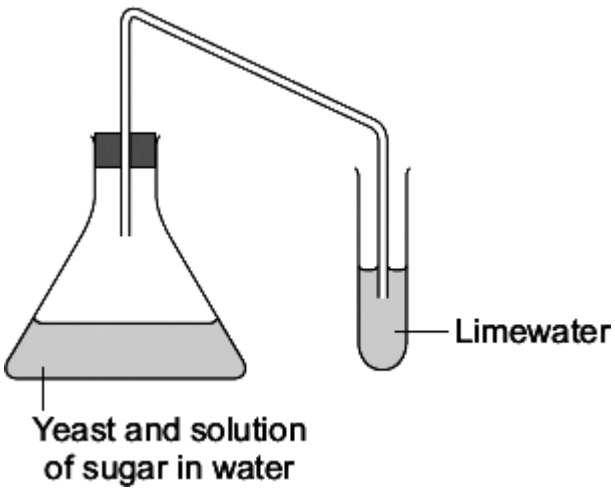
Q2. Two fuels that can be used for cars are:

- petrol from crude oil
- ethanol made from sugar in plants.

(a) A student used the apparatus shown to investigate the reaction to make ethanol from sugar.



(i) Draw a ring around the correct answer to complete the sentence

This reaction to make ethanol from sugar is

combustion.
decomposition.
fermentation.

(1)

(ii) Complete the sentences.

The limewater turns ..... .

This happens because ..... .

(2)

(b) In 1970, the Brazilian Government stated that all petrol must contain more than 25% ethanol.

The reasons for this statement in 1970 were:

- Brazil did not have many oilfields

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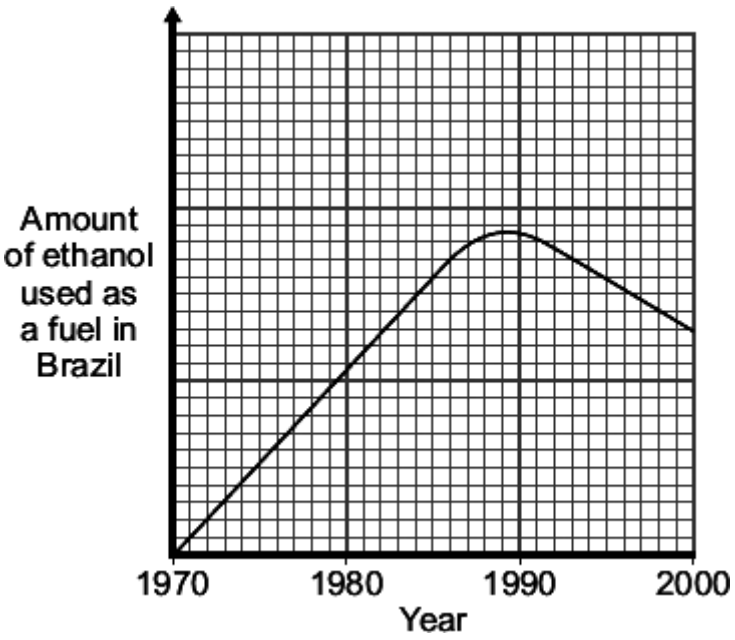
- Brazil has a climate suitable for growing sugar cane.

The graph shows the amount of ethanol used as a fuel in Brazil from 1970 to 2000.



(i) Use the graph to describe the changes in the amount of ethanol used as a fuel in Brazil from 1970 to 2000.

.....

.....

.....

.....

(2)

(ii) In 2011, the Brazilian Government decided to reduce the amount of ethanol in petrol to 18%.

Suggest **one** reason for their decision.

.....

.....

(1)

(Total 6 marks)

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Q3. Ethanol (C_2H_5OH) can be made from ethene or from sugar.

(a) Complete the table which shows the number of atoms of each element in the formula of ethanol.

Use the Chemistry Data Sheet to help you to complete the table.

Element	Symbol	Number of atoms in the formula C_2H_5OH
Carbon	C	2
Hydrogen	H	.....
.....	O	1

(2)

(b) Ethene (C_2H_4) is produced when hydrocarbons are cracked.

(i) Tick (✓) **two** conditions needed to crack a hydrocarbon.

Condition	Tick (✓)
The presence of an emulsifier.	
Heating the hydrocarbon to a high temperature.	
Adding oxygen to the hydrocarbon.	
The presence of a catalyst.	

(2)

(ii) Draw the missing bonds to complete the displayed structure of ethene.

H H

C C

H H

(1)

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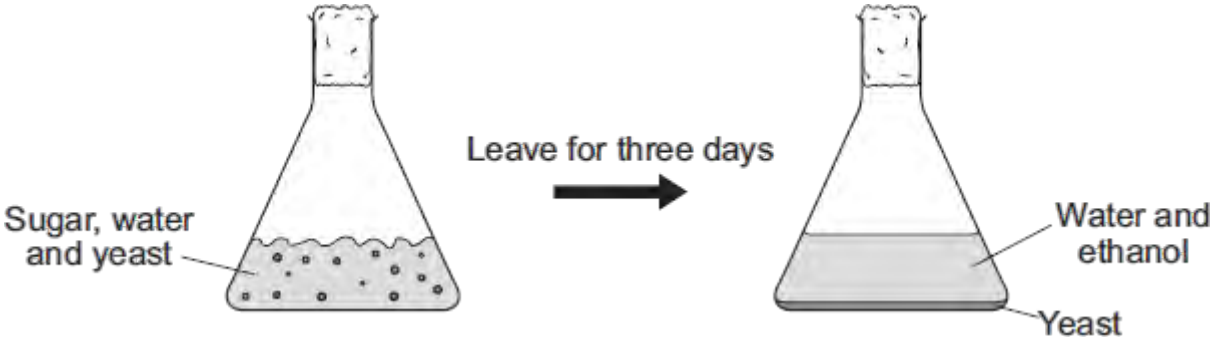
(iii) Name the substance added to ethene (C_2H_4) to produce ethanol (C_2H_5OH).

.....

(1)

(c) The diagram shows how a solution of ethanol is made from sugar dissolved in water.

The boiling point of ethanol is 78°C and the boiling point of water is 100°C.



(i) Name the gas produced during this reaction.

.....

(1)

(ii) What are the main steps needed to obtain pure ethanol from the mixture produced after three days?

.....

.....

.....

.....

(2)
(Total 9 marks)

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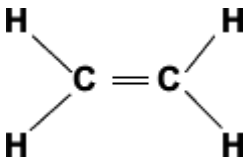
Q4. Supermarkets in the UK have been advised by the Government to stop giving plastic bags to customers.
Plastic bags are made from a polymer.
The polymer is made from ethene.

The structural formula of ethene is shown.



Ethene is made by cracking hydrocarbons.
These hydrocarbons come from crude oil.

(a) Complete these sentences about ethene.

(i) Ethene is a hydrocarbon because it contains only ..... and

.....

(2)

(ii) Ethene is unsaturated because it has a ..... bond.

(1)

(b) Tick (✓) the name of the polymer formed when many ethene molecules join together.

Name of polymer	Tick (✓)
poly(chloroprene)	
poly(ethene)	
poly(propene)	

(1)

(c) Suggest **two** reasons why supermarkets should stop giving plastic bags to customers.

1 .....

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.....

2 .....

.....

(2)
(Total 6 marks)

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