Paper 1

Questions are applicable for both core and extended candidates

1 Which statements about ethanol are correct?

1 Ethanol is made by reacting steam with ethene at 300 °C.

2 Ethanol is made by fermentation at 55 °C.

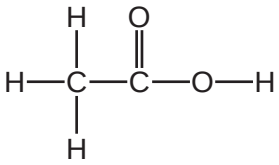
3 Ethanol burns to produce carbon dioxide and water.

4 Ethanol contains a carbon–carbon double bond.

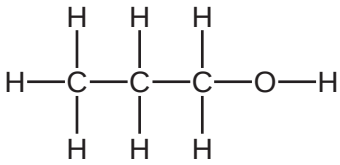
A 1 and 2 **B** 1 and 3 **C** 2 and 3 **D** 3 and 4

2 Which diagram shows the displayed formula of ethanol?

A



B



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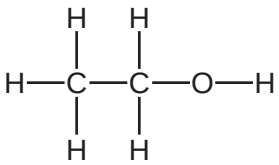
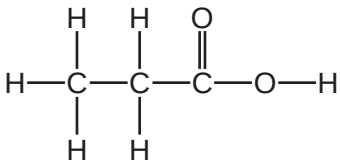


D



3 What is the word equation for the preparation of ethanol?

A glucose → ethanol + carbon dioxide

B glucose + yeast → ethanol + water

C ethane + water → ethanol

D ethene + water → ethanol + carbon dioxide

4 Which statements about ethanol are correct?

1 Ethanol is used as a solvent.

2 Ethanol can be made directly from ethane.

3 Ethanol is a covalent compound.

A 1 only **B** 1 and 2 **C** 1 and 3 **D** 2 and 3

Paper 2

Questions are applicable for both core and extended candidates unless indicated in the question

5 Which statements about the reaction of ethene with steam are correct?

1 The product has a higher molecular mass than ethane.

2 The product reacts with aqueous bromine.

3 The number of electrons shared between carbon atoms decreases.

4 The reaction produces an alcohol and hydrogen.

A 1 and 2 **B** 1 and 3 **C** 2 and 4 **D** 3 and 4

6 Ethanol is produced industrially by fermentation and also by a catalysed addition reaction involving steam.

Which row describes one advantage of each process? **(extended only)**

	fermentation	catalysed addition reaction involving steam
A	the reactant used is renewable	it is a continuous process
B	the reactant used is renewable	it requires little energy
C	it is a very rapid reaction	it is a continuous process
D	it is a very rapid reaction	it requires little energy

7 Ethanol can be produced by fermentation or by the catalytic addition of steam to ethene.

Which row shows an advantage and a disadvantage for each process? **(extended only)**

	fermentation		catalytic addition of steam to ethene	
	advantage	disadvantage	advantage	disadvantage
A	batch process	slow reaction	continuous process	fast reaction
B	fast reaction	continuous process	pure ethanol formed	renewable raw material
C	renewable raw material	batch process	pure ethanol formed	slow reaction
D	renewable raw material	impure ethanol formed	fast reaction	finite raw material

8 Ethanoic acid is made by reacting ethanol with acidified potassium manganate(VII).

Which type of reaction occurs when ethanol reacts with acidified potassium manganate(VII)?

A displacement

B fermentation

C oxidation

D neutralisation

9 Ethanol is made industrially by the fermentation of glucose or by the catalytic addition of steam to ethene.

Which statement describes an advantage of fermentation compared to catalytic addition?

(extended only)

A Ethanol is the only product of fermentation.

B Fermentation uses a batch process but catalytic addition is continuous.

C Fermentation uses a higher temperature than catalytic addition.

D Fermentation uses a renewable resource.