

Paper 1

Questions are applicable for both core and extended candidates

1 Which statement describes methane?

- A It is an alcohol.
- B It is an unsaturated molecule.
- C It contains carbon, hydrogen and oxygen atoms only.
- D Its molecules contain four single covalent bonds.

2 Which equation represents the cracking of an alkane?

- A $3\text{C}_2\text{H}_4 \rightarrow \text{C}_6\text{H}_{12}$
- B $\text{C}_6\text{H}_{12} + \text{H}_2 \rightarrow \text{C}_6\text{H}_{14}$
- C $\text{C}_6\text{H}_{14} \rightarrow 6\text{C} + 7\text{H}_2$
- D $\text{C}_6\text{H}_{14} \rightarrow \text{C}_2\text{H}_4 + \text{C}_4\text{H}_{10}$

3 Which statement about ethane is correct?

- A It decolourises bromine water.
- B It burns in excess oxygen to form water and carbon dioxide.
- C Its molecular formula is C_2H_4 .
- D Its atoms are joined together by ionic bonding.

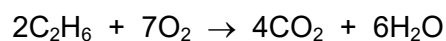
4 Some properties of colourless liquid L are listed.

- It boils at 65°C .
- When added to water, two layers form which do not mix.
- It does not react with sodium carbonate.
- It has no effect on bromine water.

What is L?

- A ethanol
- B hexane
- C hexene
- D ethanoic acid

- 5 The fuel ethane, C₂H₆, burns in air to form carbon dioxide and water.



Which statement about burning ethane is correct?

- A When one molecule of ethane burns, one molecule of water is formed.
 - B The number of atoms at the end of the reaction is the same as at the start.
 - C During the reaction there is a decrease in the number of molecules.
 - D The reaction is endothermic.
- 6 Which reactions produce carbon dioxide?

- 1 addition of dilute nitric acid to copper(II) carbonate
- 2 heating zinc carbonate
- 3 combustion of methane

- A 1,2 and 3 B 1 and 2 only C 1 and 3 only D 3 only

- 7 Which type of covalent bond is found in both a molecule of methane and a molecule of ethane?

- A a double bond between a carbon atom and a hydrogen atom
- B a double bond between two carbon atoms
- C a single bond between a carbon atom and a hydrogen atom
- D a single bond between two carbon atoms

Paper 2

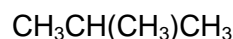
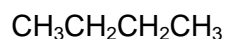
Questions are applicable for both core and extended candidates unless indicated in the question

- 8 Methane and chlorine react to form chloromethane.

Which row describes the necessary reaction condition and the type of reaction? (extended only)

	reaction condition	type of reaction
A	ultraviolet light	substitution
B	nickel catalyst	substitution
C	nickel catalyst	addition
D	ultraviolet light	addition

- 9 The structural formulae of two hydrocarbons are shown.



Which statement about the hydrocarbons is correct?

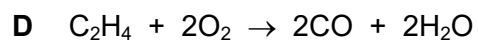
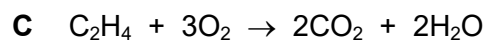
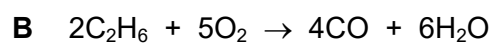
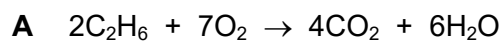
- A** They are both alkenes.
 - B** They decolourise aqueous bromine.
 - C** They are structural isomers.
 - D** They undergo addition reactions.
- 10 When a mixture of methane and chlorine is exposed to ultraviolet light, a reaction takes place.

Which statements about this reaction are correct? (extended only)

- 1 It is an addition reaction.
 - 2 The ultraviolet light provides the activation energy.
 - 3 An equation for the reaction is $\text{CH}_4 + \text{Cl}_2 \rightarrow \text{CH}_2\text{Cl}_2 + \text{H}_2$.
 - 4 CH_3Cl is made in the reaction.
- A** 1 and 3 **B** 1 and 4 **C** 2 and 3 **D** 2 and 4

11 Ethane is used as a fuel.

Which equation shows the complete combustion of ethane?



12 Which equation representing a reaction of methane is correct? (extended only)

