Q1.

1,1-Dichloroethane (**Y**) reacts with chlorine to form hexachloroethane (**Z**).

Which is the correct equation for this reaction?

A **Y** + 6 Cl_2 → **Z** + 6 HCl ○

B **Y** + 4 Cl_2 → **Z** + 4 HCl ○

C **Y** + 3 Cl_2 → **Z** + 3 H_2 ○

D **Y** + 2 Cl_2 → **Z** + 2 H_2 ○

(Total 1 marks)

Q2.

Octadecane is a straight-chain alkane containing 18 carbon atoms per molecule.
It is cracked to produce oct-1-ene and two other compounds.

Which equation represents this reaction?

A $C_{18}H_{36} \rightarrow C_8H_{16} + C_6H_{12} + 2\ C_2H_4$ ○

B $C_{18}H_{38} \rightarrow C_8H_{16} + C_4H_{10} + 2\ C_3H_6$ ○

C $C_{18}H_{38} \rightarrow C_8H_{18} + C_2H_4 + 2\ C_4H_8$ ○

D $C_{18}H_{38} \rightarrow C_8H_{18} + C_4H_8 + 2\ C_3H_6$ ○

(Total 1 marks)

Q3.

Which of these alkanes has the highest boiling point?

A Decane ○

B Hexane ○

C 2,3-dimethyloctane ○

D 2,3-dimethylbutane ○

(Total 1 marks)

Q4.

Which equation represents a propagation step in the chlorination of methane?

A $\bullet H + Cl_2 \rightarrow HCl + \bullet Cl$ ○

B $\bullet Cl + CH_4 \rightarrow CH_3Cl + \bullet H$ ○

C $\bullet CH_3 + Cl_2 \rightarrow CH_3Cl + \bullet Cl$ ○

D $\bullet CH_3 + \bullet Cl \rightarrow CH_3Cl$ ○

(Total 1 mark)

Q5.

Which is the overall equation for the reaction of $CCl_3CH_2CCl_3$ with an excess of chlorine in ultraviolet radiation?

A $CCl_3CH_2CCl_3 + \frac{1}{2}Cl_2 \rightarrow CCl_3CHClCCl_3 + \frac{1}{2}H_2$ ○

B $CCl_3CH_2CCl_3 + Cl_2 \rightarrow CCl_3CHClCCl_3 + HCl$ ○

C $CCl_3CH_2CCl_3 + 2\ Cl_2 \rightarrow CCl_3CCl_2CCl_3 + 2\ HCl$ ○

D $CCl_3CH_2CCl_3 + Cl_2 \rightarrow CCl_3CCl_2CCl_3 + H_2$ ○

(Total 1 mark)

Q6.

When hexadecane ($C_{16}H_{34}$) is heated to a high temperature, one molecule of hexadecane decomposes to form an alkane containing eight carbon atoms and two different unsaturated compounds.

Which equation could represent this reaction?

A $C_{16}H_{34} \rightarrow C_8H_{16} + C_5H_{12} + C_3H_6$ ○

B $C_{16}H_{34} \rightarrow C_8H_{18} + C_6H_{10} + C_2H_6$ ○

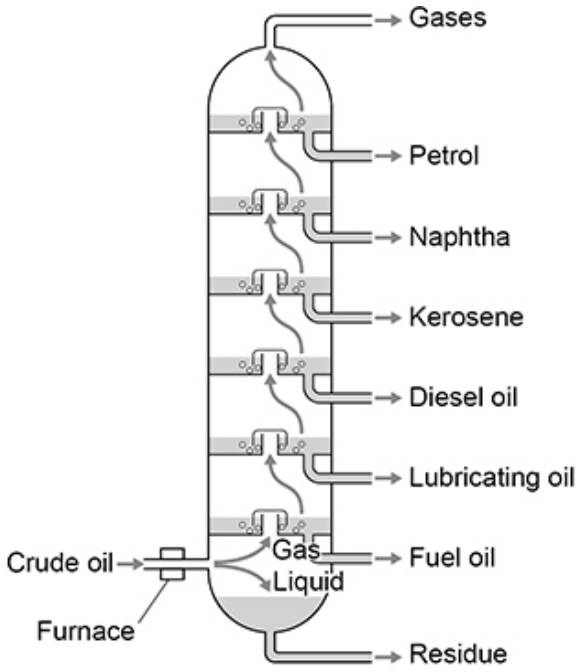
C $C_{16}H_{34} \rightarrow C_8H_{18} + 2\ C_2H_4 + C_4H_8$ ○

D $C_{16}H_{34} \rightarrow C_8H_{18} + C_6H_{14} + C_2H_2$ ○

(Total 1 mark)

Q7.

The diagram shows a fractionating column used in the industrial fractional distillation of crude oil.



Which statement is correct?

A The most viscous product is fuel oil. ⬭

B The boiling point of naphtha is higher than diesel oil. ⬭

C Molecules in diesel oil are held together by hydrogen bonds. ⬭

D Kerosene is a mixture of compounds. ⬭

(Total 1 mark)

Q8.

2-Bromopropane reacts with bromine to form 2,2-dibromopropane.

What is the name of the mechanism of this reaction?

A Electrophilic addition ⬭

B Elimination ⬭

C Free-radical substitution ⬭

D Nucleophilic substitution ⬭

(Total 1 mark)