Q1.Which of these substances does not contribute to the greenhouse effect?

A Unburned hydrocarbons.


B Carbon dioxide. $\square$
C Water vapour.


D Nitrogen. $\square$
(Total 1 mark)

Q2. Which molecule is not produced when ethane reacts with bromine in the presence of ultraviolet light?

A $\mathrm{C}_{2} \mathrm{H}_{4} \mathrm{Br}_{2}$


B HBr


C $\mathrm{H}_{2}$ $\square$
D $\mathrm{C}_{4} \mathrm{H}_{10}$

(Total 1 mark)

Q3.The percentage by mass of carbon is $83.3 \%$ in
A propane.
B butane.
C pentane.
D hexane.

Q4.Which one of the following types of reaction mechanism is not involved in the above sequence?


A free-radical substitution
B nucleophilic substitution
C elimination
D nucleophilic addition-elimination
(Total 1 mark)

Q5.Which one of the following mechanisms is not involved in the reaction sequence below?

$$
\mathrm{CH}_{3} \mathrm{CH}_{3} \rightarrow \mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{Cl} \rightarrow \mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{OH} \rightarrow \mathrm{CH}_{2}=\mathrm{CH}_{2} \rightarrow \mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{Br}
$$

A electrophilic addition
B electrophilic substitution
C nucleophilic substitution
D free-radical substitution

Q6.An alkane contains 30 hydrogen atoms per molecule. Its empirical formula is
A $\mathrm{C}_{6} \mathrm{H}_{15}$
B $\quad \mathrm{C}_{7} \mathrm{H}_{15}$
C $\quad \mathrm{C}_{14} \mathrm{H}_{30}$
D $\mathrm{C}_{15} \mathrm{H}_{30}$

Q7.Which one of the following is least likely to occur in the reaction between methane and chlorine?
A $\mathrm{CH}_{4}+\mathrm{Cl} \bullet \rightarrow \mathrm{CH}_{3} \bullet+\mathrm{HCl}$
B $\mathrm{CH}_{3} \bullet+\mathrm{HCl} \rightarrow \mathrm{CH}_{3} \mathrm{Cl}+\mathrm{H} \bullet$
C $\mathrm{CH}_{3} \bullet+\mathrm{Cl}_{2} \rightarrow \mathrm{CH}_{3} \mathrm{Cl}+\mathrm{Cl} \bullet$
D $\mathrm{CH}_{3} \mathrm{Cl}+\mathrm{Cl} \bullet \rightarrow \mathrm{CH}_{2} \mathrm{Cl} \bullet+\mathrm{HCl}$
(Total 1 mark)

Q8. Which one of the following reactions involves nucleophilic addition?
A $\mathrm{CH}_{3} \mathrm{CH}=\mathrm{CH}_{2}+\mathrm{HBr} \rightarrow \mathrm{CH}_{3} \mathrm{CHBrCH}_{3}$
B $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}_{3}+\mathrm{Cl}_{2} \rightarrow \mathrm{CH}_{3} \mathrm{CHClCH}_{3}+\mathrm{HCl}$
C $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}_{2} \mathrm{Br}+\mathrm{NaOH} \rightarrow \mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}_{2} \mathrm{OH}+\mathrm{NaBr}$
D $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CHO}+\mathrm{HCN} \rightarrow \mathrm{CH}_{3} \mathrm{CH} \mathrm{CH}(\mathrm{OH}) \mathrm{CN}$
(Total 1 mark)

