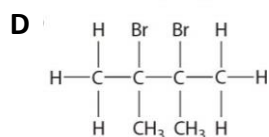
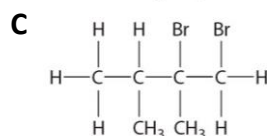
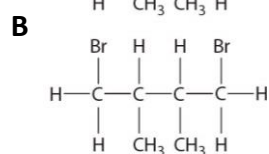
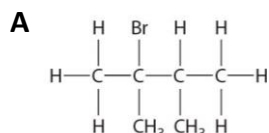


Name \_\_\_\_\_ Date \_\_\_\_\_

# End of Chapter 21 test

*This test and its sample answers have been written by the authors. IB may award marks differently.*

1 What is the organic product when 2,3-dimethylbut-2-ene reacts with bromine in the dark?



2 Which of the following species is not a free radical?

- A OH
- B OH<sup>-</sup>
- C NO
- D NO<sub>2</sub>

3 Which of the following reactions occurs via a free radical mechanism?

- A  $\text{C}_3\text{H}_6 + \text{Br}_2 \rightarrow \text{C}_3\text{H}_6\text{Br}_2$
- B  $\text{C}_6\text{H}_6 + \text{Br}_2 \rightarrow \text{C}_6\text{H}_5\text{Br} + \text{HBr}$
- C  $\text{CH}_3\text{Cl} + \text{NaOH} \rightarrow \text{CH}_3\text{OH} + \text{NaCl}$
- D  $\text{C}_4\text{H}_{10} + \text{Br}_2 \rightarrow \text{C}_4\text{H}_8\text{Br}_2 + 2\text{HBr}$

4 Which of the following species reacts most quickly with  $\text{C}_3\text{H}_8$ ?

- A Br
- B Br<sub>2</sub>
- C Br<sup>-</sup>
- D HBr

5 Which of the following molecules will produce the greatest number of different substitution products when one of the H atoms in the molecule is replaced by a Cl atom?

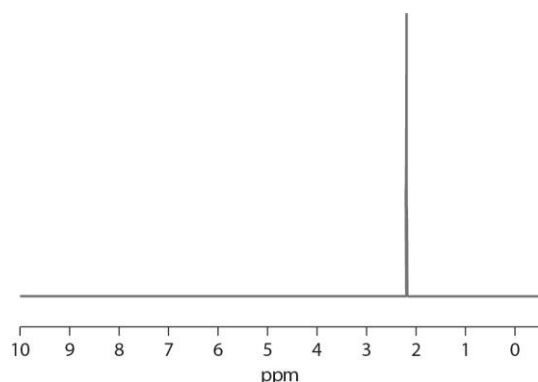
- A butane
- B pentane
- C 2-methylpentane
- D 3-methylpentane

6 Which of the following statements about a chlorine radical are correct?

- I It has a negative charge.
- II It has 17 electrons.
- III It can be formed by heterolytic fission.

- A I only
- B II only
- C I and II only
- D I, II and III

7 When propane reacts with chlorine, which one of the possible products has the following NMR spectrum?



- A 1-chloropropane
- B 2-chloropropane
- C 1,2-dichloropropane
- D 2,2-dichloropropane

8 Which reaction represents the homolytic fission of a Br–Br bond?

- A  $\text{Br}_2 \rightarrow 2\text{Br}^\bullet$
- B  $\text{Br}_2 \rightarrow \text{Br}^- + \text{Br}^+$
- C  $\text{Br}_2 \rightarrow 2\text{Br}^+ + 2\text{e}^-$
- D  $\text{Br}_2 \rightarrow 2\text{Br}^-$

END OF TEST