Haloalkanes (MCQ)

1. Which of the following reactions produce propan-1-ol?

1 The alkaline hydrolysis of 1-chloropropane.
2 The acid hydrolysis of propyl methanoate.
3 The acid hydrolysis of propanenitrile.

A 1, 2 and 3
B Only 1 and 2
C Only 2 and 3
D Only 1

Your answer ☐ **[1]**

2. Which row describes a nucleophile?

A	electron pair donor	attracted to high electron density
B	electron pair donor	attracted to low electron density
C	electron pair acceptor	attracted to high electron density
D	electron pair acceptor	attracted to low electron density

Your answer ☐ **[1]**

3. Which compound does **not** react with nucleophiles?

A CH_3CH_2CHO
B CH_3CHCH_2
C $CH_3CH_2COCH_3$
D $CH_3CH_2CH_2C\mathit{l}$

Your answer ☐ **[1]**

4. The breakdown of ozone is catalysed by NO radicals.

Which equation is a propagation step in the mechanism for this process?

A $NO + O_2 \rightarrow N + O_3$
B $NO + O_2 \rightarrow NO_2 + O$
C $N + O_3 \rightarrow NO + O_2$
D $NO_2 + O \rightarrow NO + O_2$

Your answer ☐ **[1]**

5. A chemist compares the rates of hydrolysis of 1-chloropropane and 1-bromopropane in ethanol.

Which reagent in aqueous solution should be used?

A Silver chloride
B Silver nitrate
C Potassium chloride
D Potassium nitrate

Your answer ☐ **[1]**

6. A reaction sequence is shown below:

Step 1 $CH_3CH=CHCH_3 + HBr \rightarrow CH_3CH_2CHBrCH_3$
Step 2 $CH_3CH_2CHBrCH_3 + NaOH \rightarrow CH_3CH_2CH(OH)CH_3 + NaBr$

Which type of reaction mechanism is involved in each step?

	Step 1	**Step 2**
A	electrophilic addition	electrophilic substitution
B	electrophilic addition	nucleophilic substitution
C	nucleophilic addition	electrophilic substitution
D	nucleophilic addition	nucleophilic substitution

Your answer ☐

[1]

7. When heated with NaOH(aq), 1-iodobutane is hydrolysed at a much faster rate than 1-chlorobutane.

Which statement explains the different rates?

A The C−I bond enthalpy is greater than the C−C*l* bond enthalpy.
B The C−I bond is less polar than the C−C*l* bond.
C The C−I bond has a C atom with a greater δ+ charge than in the C−C*l* bond.
D The C−I bond requires less energy to break than the C−C*l* bond.

Your answer ☐

[1]

8. A chemist investigates the rate of hydrolysis of the haloalkanes.
Which of the following statements is / are true?

1: A fluoroalkane gives the slowest rate of hydrolysis.

2: The rate of reaction depends on the strength of the carbon–halogen bond.

3: The rate of reaction depends on the polarity of the carbon–halogen bond.

A. 1, 2 and 3
B. Only 1 and 2
C. Only 2 and 3
D. Only 1

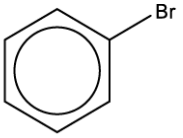
Your answer ☐

[1]

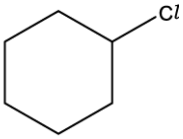
9. An organic compound is heated with aqueous silver nitrate and ethanol.
A cream solid forms.

Which structure is most likely to be the organic compound?

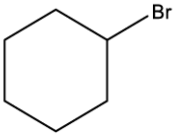
A



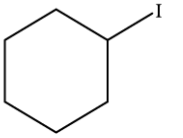
B



C



D



Your answer ☐

[1]

END OF QUESTION PAPER

Mark scheme – Haloalkanes (MCQ)

Question			Answer/Indicative content	Marks	Guidance
1			**B**	1 (AO2.3)	
			Total	**1**	
2			**B**	1 (AO1.2)	**Examiner's Comments** Many candidates correctly chose B, with A being seen as the expected main distractor. Fewer than half the candidates scored this mark.
			Total	**1**	
3			**B**	**1**	**Examiner's Comments** The majority of candidates identified B (an alkene) as the compound that does not react with nucleophiles.
			Total	**1**	
4			**D**	**1**	**Examiner's Comments** Candidates found this multiple choice question difficult. While some correctly selected D, many candidates chose B.
			Total	**1**	
5			B	1	**Examiner Comments** This question was answered correctly by over 90% of candidates with the most common incorrect response, silver chloride being given by those who may have named a precipitate formed in the test rather than the reagent required.
			Total	**1**	
6			B	1	**Examiner's Comments** Generally scored well.
			Total	**1**	
7			D	1	**Examiner's Comments** Generally scored well.
			Total	**1**	

8			B	1	
			Total	**1**	
9			C	1	
			Total	**1**	