

## Carboxylic Acids and Esters (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 of these reagent(s) will **not** react with  $\text{HOCH}_2\text{CH}_2\text{CH}_2\text{COOH}$ ?

- A** NaCN in ethanol  
**B**  $\text{C}_2\text{H}_5\text{OH}$  in the presence of an acid catalyst  
**C**  $(\text{CH}_3\text{CO})_2\text{O}$   
**D** concentrated  $\text{H}_2\text{SO}_4$

Your answer

[1]

3. Which one of the following reacts with ethanoic acid **and** with phenol?

- A** Aqueous potassium hydroxide  
**B** Bromine  
**C** Calcium carbonate  
**D** Methanol and an acid catalyst

Your answer

[1]

4. Equal amounts of the four compounds are added to the same volume of water.

Which compound would produce the most acidic solution?

- A  $\text{CH}_3\text{CONH}_2$
- B  $\text{CH}_3\text{COOH}$
- C  $\text{CH}_3\text{COOCH}_3$
- D  $\text{CH}_3\text{COC/}$

Your answer

[1]

5. 0.1 mol of  $\text{HOOCCH}_2\text{COOH}$  are reacted with 0.1 mol of aqueous  $\text{NaOH}$ .

How many molecules of water are formed?

- A  $6.02 \times 10^{22}$
- B  $3.01 \times 10^{22}$
- C  $6.02 \times 10^{23}$
- D  $3.01 \times 10^{23}$

Your answer

[1]

6. Which reagent could be used to distinguish between  $\text{CH}_3\text{CH}_2\text{OH}$  and  $\text{C}_6\text{H}_5\text{OH}$ ?

- A  $\text{AgNO}_3(\text{aq})$  in ethanol
- B  $\text{CH}_3\text{COC/}$
- C  $\text{Na}_2\text{CO}_3(\text{aq})$
- D Bromine water

Your answer

[1]

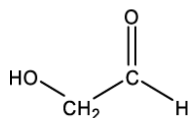
7. Which compound **cannot** be hydrolysed?

- A  $\text{CH}_3\text{COOH}$
- B  $\text{CH}_3\text{COC/}$
- C  $\text{CH}_3\text{CONHCH}_3$
- D  $\text{CH}_3\text{COOCH}_3$

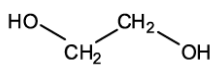
Your answer

[1]

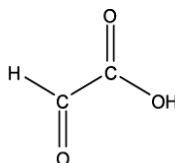
8. Which molecule is the most soluble in water?



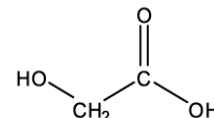
A



B



C



D

Your answer

[1]

9. Which alcohol could be used to prepare  $\text{HCOOCH}(\text{CH}_3)_2$ ?

- A. Propan-1-ol
- B. Propan-2-ol
- C. 2-Methylpropan-2-ol
- D. Methanol

Your answer

[1]

10. Two chemical tests are carried out on an aqueous solution of an aromatic organic compound Y.

The results of the tests are shown below.

Test	$\text{Br}_2(\text{aq})$	$\text{Na}_2\text{CO}_3(\text{aq})$
Observation	decolourised	effervescence

What is the minimum number of C atoms in Y?

- A. 6
- B. 7
- C. 8
- D. 9

Your answer

[1]

END OF QUESTION PAPER

# Mark scheme – Carboxylic Acids and Esters (MCQ)

Question			Answer/Indicative content	Marks	Guidance
1			B	1 (AO2.3)	
			<b>Total</b>	<b>1</b>	
2			A	1 (AO1.1)	
			<b>Total</b>	<b>1</b>	
3			A	1 (AO1.1)	
			<b>Total</b>	<b>1</b>	
4			D	1	<b>Examiner Comments</b> In contrast to question 9, this proved to be the most difficult of the multiple choice questions for candidates who frequently gave B, ethanoic acid as their answer. The correct answer, D, an acyl chloride reacts with water to produce acidic fumes of HCl which are soluble in water and a carboxylic acid.
			<b>Total</b>	<b>1</b>	
5			A	1	<b>Examiner Comments</b> Candidates across the whole ability range appeared to find the question equally challenging. The common incorrect answer B, resulted from a failure to use the information that equal moles of acid were reacted with equal moles of alkali to produce an equal number of moles of water.
			<b>Total</b>	<b>1</b>	
6			D	1	
			<b>Total</b>	<b>1</b>	
7			A	1	
			<b>Total</b>	<b>1</b>	
8			D	1	
			<b>Total</b>	<b>1</b>	
9			B	1	
			<b>Total</b>	<b>1</b>	

10			B	1	
			<b>Total</b>	<b>1</b>	