



**A-Level Chemistry**  
**Carboxylic Acids and Esters**  
**(Multiple Choice)**  
**Question Paper**

**Time available: 13 minutes**  
**Marks available: 13 marks**

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1. Which statement about  $(\text{CH}_3)_2\text{CHCH}_2\text{COOH}$  is correct?

- A In aqueous solution it reacts with magnesium to form carbon dioxide.
- B It can form hydrogen bonds.
- C It has optical isomers.
- D It has the IUPAC name 2-methylbutanoic acid.

(Total 1 mark)

2. Which compound forms a white precipitate when added to aqueous silver nitrate?

- A bromoethane
- B ethanal
- C ethanoic anhydride
- D ethanoyl chloride

(Total 1 mark)

3. Which compound reacts with warm dilute aqueous sodium hydroxide?

- A  $\text{C}_6\text{H}_6$
- B  $\text{CH}_3\text{CH}=\text{CH}_2$
- C  $\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$
- D  $(\text{CH}_3\text{CO})_2\text{O}$

(Total 1 mark)

4. Which compound is formed when phenyl benzenecarboxylate is hydrolysed under acidic conditions?

A  $C_6H_5CH_2OH$

B  $C_6H_5CHO$

C  $C_6H_5COCH_3$

D  $C_6H_5COOH$

(Total 1 mark)

5. A student is required to dry a liquid sample of pentanoic acid.

Which drying agent is suitable?

A Calcium oxide

B Calcium sulfate

C Potassium hydroxide

D Potassium carbonate

(Total 1 mark)

6. Which compound is formed by acid hydrolysis of phenylmethyl ethanoate?

A  $C_6H_5CH_2OH$

B  $C_6H_5CHO$

C  $C_6H_5COCH_3$

D  $C_6H_5COOH$

(Total 1 mark)

7. Which compound can be purified by forming a hot aqueous solution that recrystallises on cooling?

A Cyclohexene

B Ethanoic acid

C Phenylamine

D Benzoic acid

(Total 1 mark)

8. In which one of the following mixtures does a redox reaction occur?

- A ethanal and Tollens' reagent
- B ethanoyl chloride and ethanol
- C ethanal and hydrogen cyanide
- D ethanoic acid and sodium hydroxide

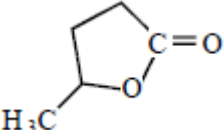
(Total 1 mark)

9. How many structural isomers, which are esters, have the molecular formula  $C_4H_8O_2$ ?

- A 2
- B 3
- C 4
- D 5

(Total 1 mark)

10.

Acid hydrolysis of  produces

- A  $CH_3CH(OH)CH_2CH_2COOH$
- B  $CH_2(OH)CH_2CH_2CH_2COOH$
- C  $CH_3CH(OH)CH_2CH_2OCHO$
- D  $CH_2(OH)CH_2CH_2CH_2OCHO$

(Total 1 mark)

**11.** An excess of methanol was mixed with 12 g of ethanoic acid and an acid catalyst. At equilibrium the mixture contained 8 g of methyl ethanoate. The percentage yield of ester present was

- A 11
- B 20
- C 54
- D 67

**(Total 1 mark)**

**12.** Butan-1-ol was converted into butyl propanoate by reaction with an excess of propanoic acid. In the reaction, 6.0 g of the alcohol gave 7.4 g of the ester. The percentage yield of ester was

- A 57
- B 70
- C 75
- D 81

**(Total 1 mark)**

**13.** Propanoic acid reacts with methanol in the presence of a small amount of concentrated sulphuric acid. The empirical formula of the ester formed is

- A  $\text{CH}_2\text{O}$
- B  $\text{C}_2\text{H}_6\text{O}_2$
- C  $\text{C}_2\text{H}_4\text{O}_2$
- D  $\text{C}_2\text{H}_4\text{O}$

**(Total 1 mark)**