Website: contoureducation.com.au | **Phone:** 1800 888 300
Email: hello@contoureducation.com.au

VCE Chemistry ½

Functional Groups in Organic Chemistry [2.7]

Test Solutions

20 Marks. 1 Minute Reading. 16 Minutes Writing

Results:

Quiz Questions	_____ / 15
Extension Questions	_____ / 5

Section A: Quiz Questions (15 Marks)

Question 1 (4 marks)

Tick whether the following statements are **true** or **false**.

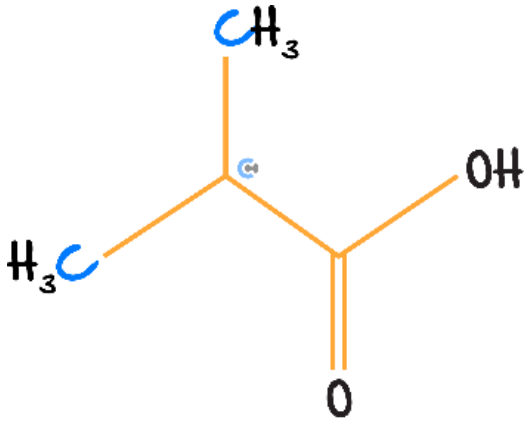
Statement	True	False
a. Carboxylic acids refer to molecules which have the -COOH functional group on one end of the molecule.	✓	
b. When numbering carbons on a carboxylic acid, we always prioritise the carbon on the carboxyl group as number 1.	✓	
c. Esters refer to a class of organic molecules which are made by reacting an alcohol and carboxylic acid, consuming a water molecule in the reaction.		✓
d. When naming esters, the carboxylic acid derivative is named first.		✓
e. Esters and carboxylic acids both have hydrogen bonds as an intermolecular force.	✓	
f. Phosphoric acid is required as a catalyst for an esterification reaction.	✓	
g. In order to break down an ester into an alcohol and a carboxylic acid, a water molecule will be required.	✓	
h. Esters can produce a variety of smells depending on the type of alcohol which has reacted with the carboxylic acid.	✓	

Space for Personal Notes

Question 2 (5 marks)

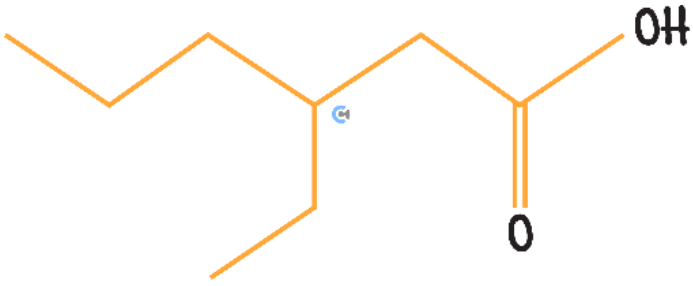
Name the following molecules, and identify at least one functional group in each:

a. (1 mark)



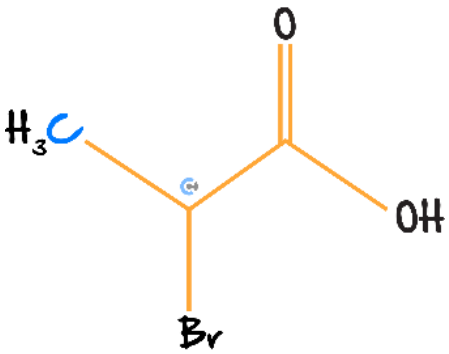
2-methylpropanoic – carboxyl

b. (1 mark)



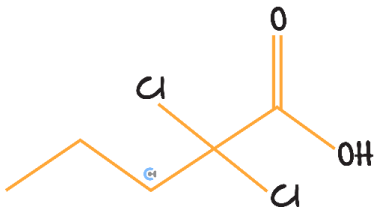
3-ethylhexanoic acid – carboxyl

c. (1 mark)



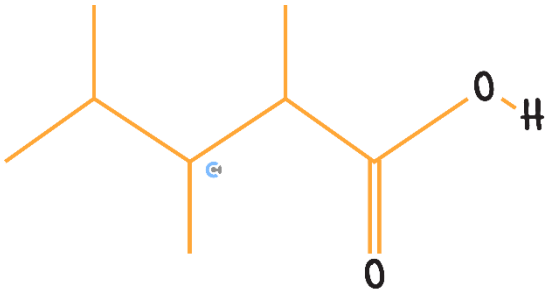
2-bromopropanoic acid - halo / carboxyl

d. (1 mark)



2,2-dichloropentanoic acid – halo / carboxyl

e. (1 mark)



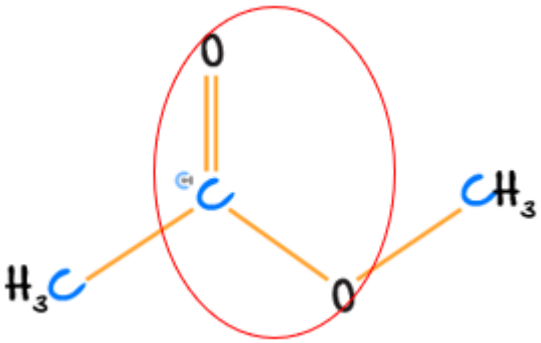
2,3,4-trimethylpentanoic acid – alkyl / carboxyl

Space for Personal Notes

Question 3 (3 marks)

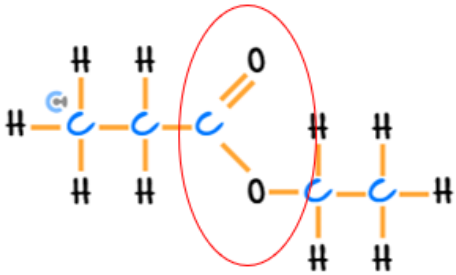
Identify the two organic chemicals which were used to create the following esters and circle the ester functional group in each molecule:

a. (1 mark)



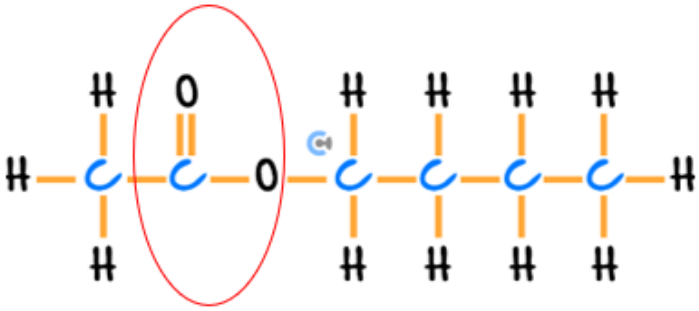
Ethanoic acid and methanol.

b. (1 mark)



Propanoic acid and ethanol.

c. (1 mark)

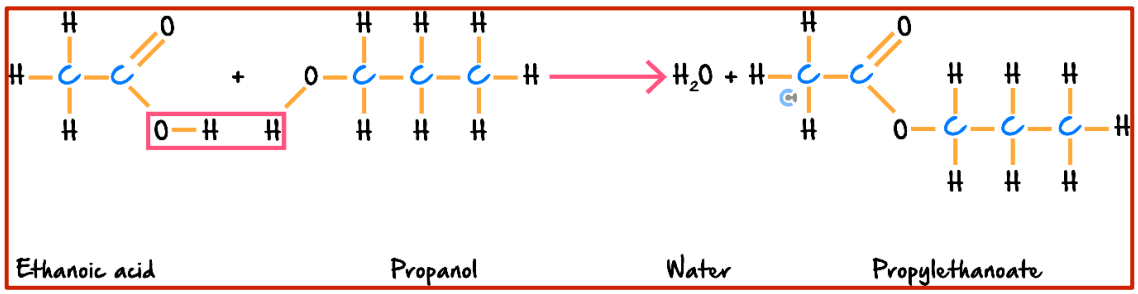


Ethanoic acid and butanol.

Question 4 (3 marks)

Christa is using different esterification reactions in her side hustle as a food chemist. She wishes to create an ester that has a strong, fruity smell.

a. Draw the structural formula for the formation of propylethanoate, labelling and naming all reactants and catalysts. (2 marks)



b. Write the name of a functional isomer of propylethanoate. (1 mark)

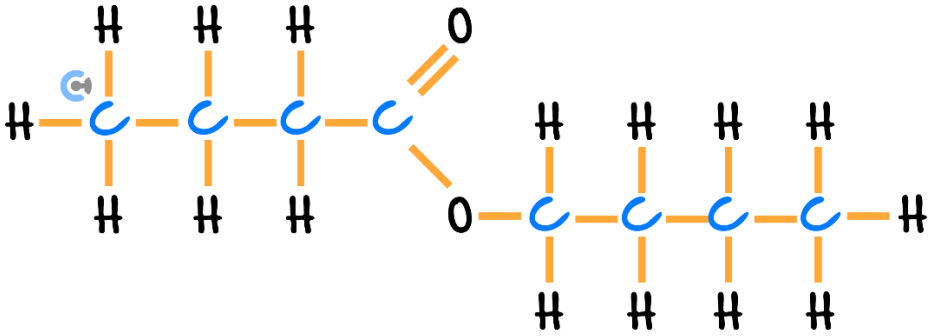
Pentanoic Acid

Space for Personal Notes

Section B: Extension Questions (5 Marks)

Question 5 (5 marks)

Harry wishes to make the following ester for his school lab experiment.



a. What are the two chemicals that Harry must react with in order to achieve this molecule? (1 mark)

Butanol and Butanoic Acid.

b. Name one physical test which Harry can conduct to identify if he has produced this molecule. (1 mark)

Smell

c. Name one chemical test which Harry can conduct to identify if he has produced this molecule. (1 mark)

pH should go up.

d. With reference to what a catalyst is, name the catalyst required to produce the molecule stated above. (1 mark).

Catalyst increases rate of reaction – Sulphuric Acid.

e. After producing this molecule by reacting the two appropriate chemicals, Harry uses a special chemical procedure to turn all of the ester, and only the ester, into a solid. However, after doing so, he notices that there is still liquid left over in the container. What could this liquid be? (1 mark)

Most likely water, as water is produced but could also be the excess reagent.

Space for Personal Notes

CONTOUREDUCATION

Website: contoureducation.com.au | **Phone:** 1800 888 300 | **Email:** hello@contoureducation.com.au

VCE Chemistry ½

Free 1-on-1 Support

Be Sure to Make the Most of These (Free) Services!

- Experienced Contour tutors (45 + raw scores, 99 + ATARs).
- For fully enrolled Contour students with up-to-date fees.
- After school weekdays and all-day weekends.

1-on-1 Video Consults	Text-Based Support
➢ Book via bit.ly/contour-chemistry-consult-2025 (or QR code below). ➢ One active booking at a time (must attend before booking the next).	➢ Message +61 440 137 304 with questions. ➢ Save the contact as "Contour Chemistry".

Booking Link for Consults

bit.ly/contour-chemistry-consult-2025

Number for Text-Based Support

+61 440 137 304