

Australian Islamic College 2019

ATAR Chemistry Units 3 and 4

Task 9 (Weighting: 3%)

Organic Chemistry Test

Test Time: 45 minutes

Please do not turn this page until instructed to do so.

First Name	Surname
ANSWERS	

Teacher

Mark / 32	Percentage

Equipment allowed: Pens, pencils, erasers, whiteout, correction tape, rulers and non-programmable calculators permitted by the Schools Curriculum and Standards Authority.

Special conditions:

2 marks will be deducted for failing to write your full name on this test paper.

Teacher help: Your teacher can only help you during your test in one situation.

If you believe there is a mistake in a question show your teacher and your teacher will tell you whether or not there is a mistake in the question and if appropriate, how to fix that mistake.

Spelling of Science words must be correct. Science words with more than one letter wrong (wrong letter and/or wrong place) will be marked wrong.

Equations must be written balanced and with correct state symbols or they will be marked wrong.

Questions must be answered in this booklet.

Total marks: 32

PART ONE: MULTIPLE CHOICE QUESTIONS (6 MARKS)

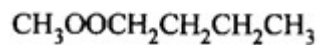
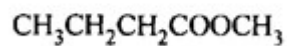
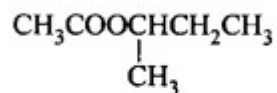
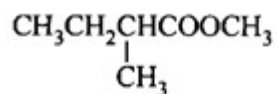
Circle the correct answer.

- Which of the following substances will not produce hydrogen gas when reacted with metallic sodium?
(A) Propanoic acid
(B) Propanal
(C) Propan-1-ol
(D) Ethanol
- The number of structural isomers with the formula C_4H_9Cl is
(A) 1
(B) 2
(C) 3
(D) 4
- How many hydrogen atoms are there in a molecule of octan-3-ol?
(A) 9
(B) 16
(C) 18
(D) 21
- A food chemist wishes to create the odour of pineapples for a product. An ester with this odour has the formula: $CH_3CH_2COOCH_2CH_3$. Which of the following pairs of reactants with the aid of a suitable catalyst would produce this ester?
(A) CH_3CH_2COOH and CH_3COOH
(B) CH_3COOH and $CH_3CH_2CH_2OH$
(C) CH_3CH_2COOH and CH_3CH_2OH
(D) CH_3CH_2OH and $CH_3CH_2CH_2OH$

5. Consider the reaction:



The structure of Y would be which of the following? Circle the correct structure.



The second structure

6. Which one of the following compounds does NOT exhibit geometrical isomerism?

- (A) $\text{CH}_3\text{CH}=\text{CCl}_2$
(B) $\text{CH}_3\text{CH}=\text{CHCH}_3$
(C) $\text{CHCl}=\text{CHCl}$
(D) $\text{CH}_3\text{CH}=\text{CHCl}$

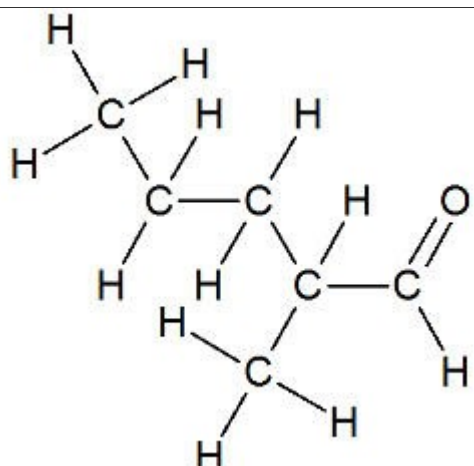
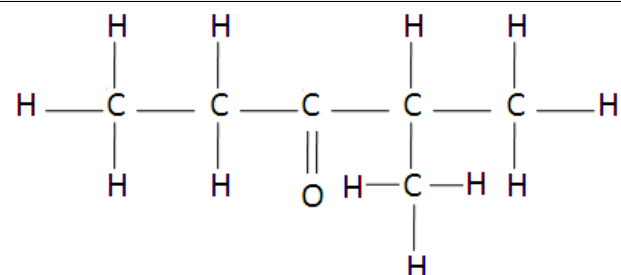
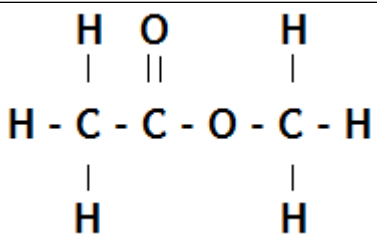
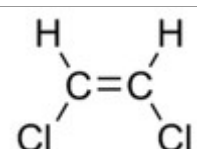
END OF MULTIPLE CHOICE SECTION

PART TWO: SHORT ANSWER QUESTIONS
(26 marks)

Answer all questions. Write your answers in the spaces provided.

7. Complete the following table:

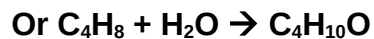
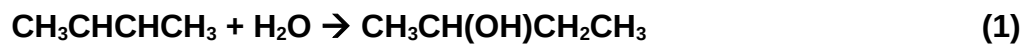
(8 marks)

Full IUPAC Name of Compound	Full Structural Formula, Including All Atoms and All Bonds	Type of Compound (e.g. alkene, alcohol, ester)
2-methylpentanal		Aldehyde
2-methylpentan-3-one		Ketone
Methyl ethanoate		Ester
cis-1,2-dichloroethene		Alkene

8. Give the balanced chemical equation, the type of reaction and name of the organic product for the reaction between trans-but-2-ene and steam. State symbols are not required.

(3 marks)

Equation:



Type of reaction: **addition (also accept 'hydration')** (1)

Product name: **butan-2-ol** (1)

9. The five substances listed below were each tested in four different ways. Complete the expected observations with each test of each substance. There may be more than one observation in some cases. One has been done for you.

(7 marks, $\frac{1}{2}$ each)

Name of Substance Tested	Substance combined with acidified potassium dichromate and heated.	Substance combined with a small piece of sodium.	Substance heated and combined with ethanoic acid and a sulfuric acid catalyst.
Butanal	Orange colour becomes deep green.	No visible reaction.	No (visible) reaction.
Butanone	No (visible) reaction.	No (visible) reaction.	No (visible) reaction.
Butan-1-ol	Orange colour becomes deep green.	Bubbles of a colourless odourless gas.	Pleasant / fruity odour appears.
Butan-2-ol	Orange colour becomes deep green.	Bubbles of a colourless odourless gas.	Pleasant / fruity odour appears.
Methylpropan-2-ol	No (visible) reaction.	Bubbles of a colourless odourless gas.	Pleasant / fruity odour appears.

10. Consider the following ester:



Note: No follow-on marks for any part of this question.

- a) Give the condensed structural formula and name of the alcohol used to produce the ester.

(2 marks)

Structural formula: **$\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$** (1)

Name: **hexan-1-ol** (1)

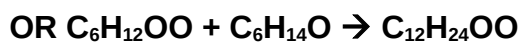
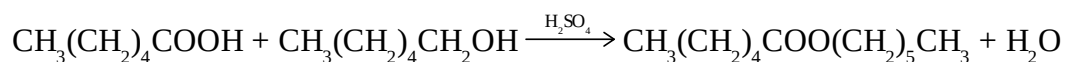
- b) Give the condensed structural formula and name of the other organic reactant required to make the ester.

(2 marks)

Structural formula: **$\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{COOH}$** (1)

Name: **hexanoic acid** (1)

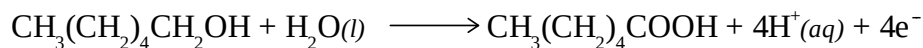
- c) Write a balanced equation for the formation of the ester. (1 mark)



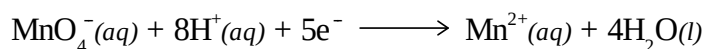
(1) – balanced equation including water as product

(d) Write balanced half-equations and then a balanced overall equation to show how the reactant in part (b) of this question may be created from an alcohol and acidified permanganate ions. State symbols are not required.

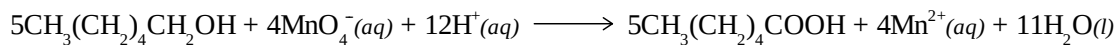
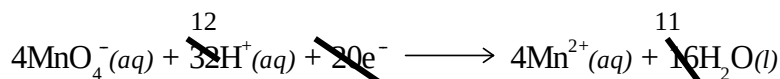
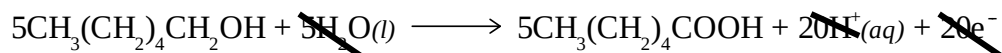
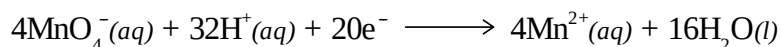
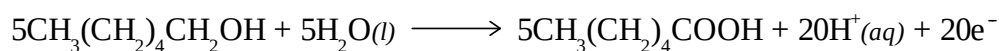
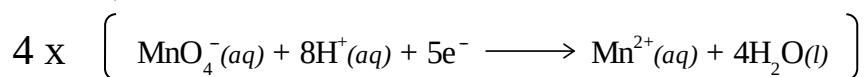
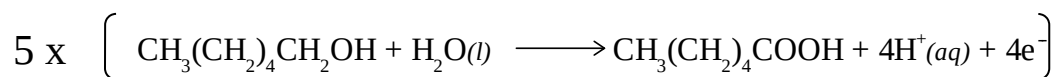
(3 marks)



(1)



(1)



(1)

END OF TEST

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