

Year 12 Chemistry Organic Chemistry Test 2019

Time allowed: 45 minutes

Name:

Teacher: DGM JT CEM JJF

Mark =/47

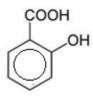
SECTION 1 MULTIPLE CHOICE 10 Questions

- 1. The formula of the isomer of hexane expected to have the lowest boiling point could be written as
 - A. $(CH_3)_2CHCH_2CH_2CH_3$
 - B. $CH_3CH_2CH(CH_3)_2$
 - C. $CH_3CH_2C(CH_3)_3$
 - D. $CH_3(CH_2)_4CH_3$
- 2. Which one of the following is the empirical formula of 1-propyl pentanoate?
 - A. $C_8H_{16}O_2$
 - B. C₄H₈O
 - C. C₇H₁₄O₂
 - D. CH₂O
- 3. Which one of the following pairs of compounds would produce biodiesel if reacted together, using an appropriate catalyst?
 - A. A triglyceride and a strong base.
 - B. A carboxylic acid and a strong oxidising agent.
 - C. An alcohol and a triglyceride.
 - D. A fatty acid and an ester.
- 4. Which of the following molecules will engage in hydrogen bonding with water?
 - I. propanone
 - II propanal
 - III propan-2-ol
 - IV 1-propyl propanoate
 - V propanamine
 - A. all of them
 - B. II, III and V only
 - C. III and V only
 - D. II and III only

10 marks

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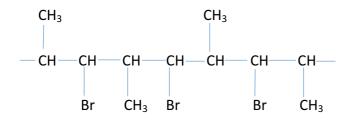
- 5. An oxidation product of 3-methylbutan-2-ol could be
 - A. methyl butanone
 - B. 3-methylbutanal
 - C. 3-methylbutanone
 - D. 3-methylbutanoic acid
- 6. Which of the following is the most likely product when propene and hydrogen bromide gas are reacted together?
 - A. $CH_3CHBrCH_2Br$
 - $B. \qquad CH_2BrCH_2CH_2Br$
 - C. $CH_3CHBrCH_3$
 - D. $CH_3CH_2CHBr_2$
- 7. Which of the following compounds has the lowest vapour pressure?
 - A. $CH_3CH_2CH_2CH_2OH$
 - B. $CH_3CH_2CH_2OHCH_3$
 - $\mathsf{C}. \qquad \mathsf{C}\mathsf{H}_3\mathsf{C}\mathsf{H}_2\mathsf{C}\mathsf{H}_2\mathsf{C}\mathsf{H}\mathsf{O}$
 - $D. \qquad \mathsf{CH}_3\mathsf{CH}_2\mathsf{COCH}_3$
- 8. Ethyl salicylate can be manufactured from salicylic acid. The structure of salicylic acid is shown to the right.



To convert salicylic acid into aspirin, with what other substance should it be reacted?

- A. ethanol
- B. ethanoic acid
- C. acidified potassium dichromate
- D. sodium hydroxide solution

9. Examine the section of the polymer shown below.



Which one of the following is the correct name for the monomer used to make this polymer?

- A. 1-methyl-2-bromoethene
- B. 1-bromoprop-2-ene
- C. 2-bromopropene
- D. 1-bromopropene
- 10. An unknown colourless liquid was subjected to a number of tests, the observations of which are shown in the table below.

Test	Observation	
The liquid was added to a solution of	The liquids mixed, but no reaction was	
sodium carbonate	observed	
The liquid was shaken with bromine	The bromine water went from orange to	
water	colourless	
The liquid was mixed with sulfuric acid	The sodium dichromate turned from	
and a solution of sodium dichromate	orange to green	

Which of the following represents a possible structure for the unknown liquid?

- A. $CH_3CH_2CH_2CH_2CH_2OH$
- B. CH₂(OH)CH₂CHCHCH₂COOH
- C. $(CH_3)_2C(OH)CH_2CHCH_2$
- $\mathsf{D}. \qquad \mathsf{CH}_3\mathsf{CH}_2\mathsf{CH}\mathsf{CH}\mathsf{CH}_2\mathsf{CH}\mathsf{O}$

SECTION 2

SHORT ANSWERS

37 marks

Question 11

4 marks

Draw the structural formulae of the following compounds, showing **ALL** bonds and atoms:

Name	Structure
(a)	
Drow on clock of that can	
Draw an alcohol that can be oxidised to butanal	
(b)	
Draw a compound with	
the molecular formula	
$C_4H_8O_2$ and a fruity odour	
(c)	
Draw a product formed when propene is hydrated	
when properle is nyurated	
(d)	
Draw the compound	
formed when your	
product from '(c)' is	
completely oxidised with	
acidified dichromate	

Write a chemical equation/s to show how the following organic products could be made. Include relevant catalysts.

(a)	ethanol	2 marks

(b) 2-propyl ethanoate

3 marks

2 marks

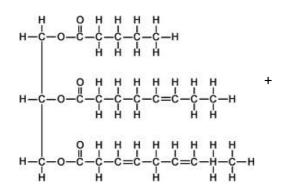
7 marks

(c) propanone

Oxidation	
Reduction	
Overall	

(a) Using the following triglyceride as a starting material, to write a reaction to show how a soap is formed.

3 marks



7 marks

(b) With the aid of a diagram, describe how a soap is able to remove grease from a surface. Your response must include reference to relevant intermolecular forces.
4 marks



8 marks

Below is a structural diagram of a tripeptide.

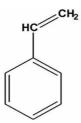
H H H		H - O H - O H H H H H H H H H H	I
(a)	Name the three α	amino acids that form the tripeptide.	3 mark
(b)	What pH environm	nent is the tripeptide in? Explain your answer	2 marks
(c)	On the above diag		
(i)		oxyl)- terminal	1 mark
(ii)	B: a peptide b		1 mark
(iii)	C: where a hy	drogen bond could form within the tripeptide.	1 mark

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Question 15

5 marks

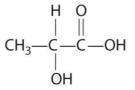
The diagram below shows the benzene derivative, styrene.



(a) In the space below, draw 3 repeating units, showing the polymer that can be formed.2 marks

(b) What is the name given to the type of reaction used to make this polymer? 1 mark

The diagram below shows the structure of lactic acid, which can form a polymer.



(c) Draw a structure of the polymer formed from lactic acid showing 2 repeating units.

2 marks

6 marks

(a) The α amino acid alanine is highly soluble in water. Account for why this is the case. $4\ marks$

(b) Draw a diagram of the structure of alanine in water and show how water molecules would orientate with the functional groups of alanine. 2 marks