

## EASE 4 CHEMISTRY GRADE 10

## Multiple Choice

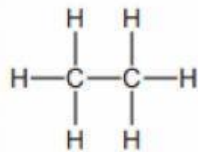
Identify the choice that best completes the statement or answers the question.

1. Which compound has a chemical name ending in *-ol*?

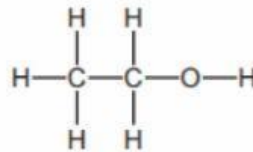
- A)  $C_2H_5OH$                       C)  $CH_3COOH$   
 B)  $C_2H_6$                           D)  $C_2H_4$

2. Which structure represents a molecule of ethanol?

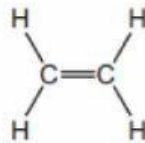
A)



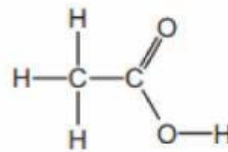
C)



B)

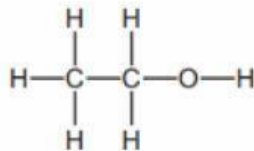


D)

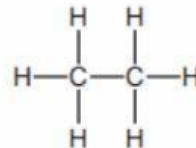


3. What is the structure of ethanoic acid?

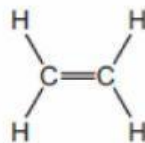
A)



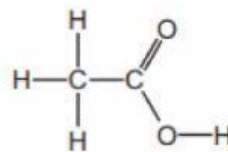
C)



B)



D)



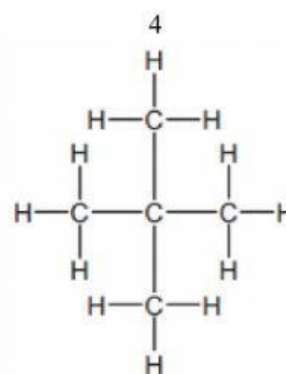
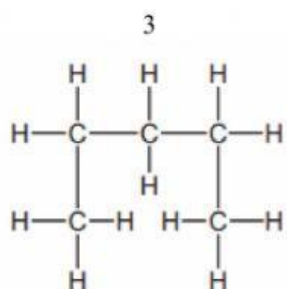
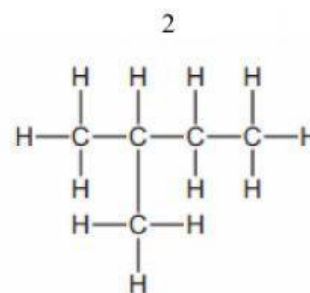
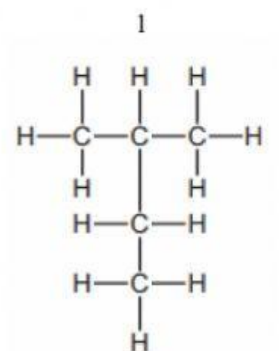
4. How many atoms are there in one molecule of ethanoic acid?

- A) 5                                      C) 8  
 B) 6                                      D) 11

Name: \_\_\_\_\_

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5. The structure of four organic molecules are shown.

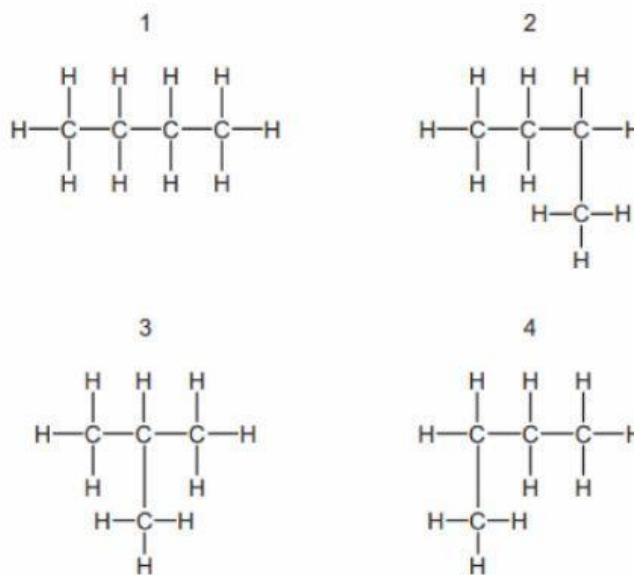


Which molecules are structural isomers of structure 1?

- A) 2 and 4
- B) 2 only

- C) 3 and 4
- D) 3 only

6. Which structures are structural isomers of each other?

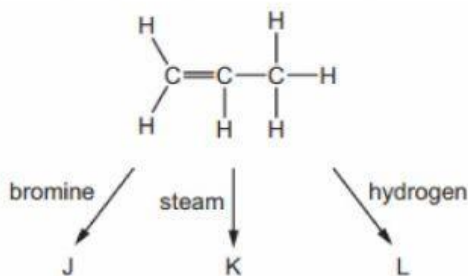


- A)** 1, 2, 3 and 4  
**B)** 1, 2 and 4 only  
**C)** 1 and 3 only  
**D)** 2 and 4 only

7. Which chemical equation for substitution of an alkane with chlorine is correct?

- A)**  $C_3H_8 + Cl_2 \rightarrow C_3H_7Cl + HCl$   
**B)**  $C_3H_6 + Cl_2 \rightarrow C_3H_6Cl_2$   
**C)**  $C_3H_8 + Cl_2 \rightarrow C_3H_6Cl_2 + H_2$   
**D)**  $C_3H_6 + Cl_2 \rightarrow C_3H_5Cl + HCl$

8. Propene is an alkene that reacts with bromine, steam and hydrogen as shown.



What are the products of these reactions?

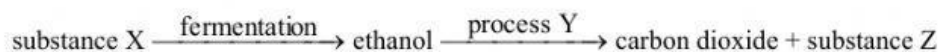
	J	K	L
A	bromopropane	propanol	butane
B	dibromopropane	propanoic acid	propane
C	dibromopropane	propanol	propane
D	bromopropane	propanoic acid	butane

- A) A    C) C  
 B) B    D) D
9. Which molecule is NOT produced by an addition reaction of ethene?
- A)  $\text{CH}_3\text{CH}_3$                                 C)  $\text{CH}_3\text{CH}_2\text{OH}$   
 B)  $\text{CH}_2\text{BrCH}_2\text{Br}$                         D)  $\text{CH}_3\text{CH}_2\text{CH}_3$
10. Which product is obtained when bromine reacts with propene,  $\text{CH}_3\text{CH}=\text{CH}_2$ ?
- A)  $\text{CH}_3\text{CH}=\text{CHBr}$                       C)  $\text{CH}_3\text{CH}_2\text{CHBr}_2$   
 B)  $\text{CH}_3\text{CBr}=\text{CHBr}$                       D)  $\text{CH}_3\text{CHBrCH}_2\text{Br}$
11. Ethane,  $\text{C}_2\text{H}_6$ , reacts with chlorine in a substitution reaction.

What are the products of this reaction?

- A) chloroethane and hydrogen            C) chloroethene and hydrogen  
 B) chloroethane and hydrogen chloride   D) chloroethene and hydrogen chloride

12. The flow chart shows preparation of ethanol and some important chemistry of ethanol.



What are X, Y and Z?

	X	Y	Z
A	yeast	combustion	oxygen
B	glucose	combustion	steam
C	glucose	polymerisation	water
D	yeast	fermentation	glucose

- A) A  
B) B  
C) C  
D) D
13. Ethanol is manufactured by the catalytic addition of steam to ethene and by fermentation.

Which statement describes an advantage of fermentation compared to the catalytic addition of steam to ethene?

- A) Fermentation is a more rapid reaction.  
B) Fermentation produces a purer product.  
C) Fermentation uses a higher temperature.  
D) Fermentation uses renewable resources.
14. Ethanol is produced by fermentation or by the reaction of ethene with steam.

Which row is correct?

	by fermentation	from ethene
A	uses a temperature of 100 °C	uses a temperature of 350 °C
B	needs yeast as a catalyst	does not need a catalyst
C	very slow reaction	very fast reaction
D	high yield of ethanol	low yield of ethanol

- A) A  
B) B  
C) C  
D) D
15. Ethanol is made on an industrial scale by fermentation of sugars or by the reaction of ethene with steam in the presence of a suitable catalyst.

What is a disadvantage of making ethanol from ethene rather than by fermentation?

- A) A continuous production process is used.  
B) A non-renewable raw material is used.  
C) The product is very pure.  
D) The rate of reaction is very high.

16. Ethanol is produced by:

- 1 the catalytic addition of steam to ethene
- 2 fermentation.

**Which statement is correct?**

- A) Both processes require similar amounts of energy.      C) Process 1 uses a renewable resource.  
B) Both processes use a catalyst.      D) Process 2 produces the purest ethanol.

17. Propanol is oxidised by acidified potassium manganate(VII) in a similar way to ethanol.

**Which compound is produced by the oxidation of propanol with acidified potassium manganate(VII)?**

- A)  $\text{CH}_3\text{CH}_2\text{OH}$       C)  $\text{CH}_3\text{COOH}$   
B)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$       D)  $\text{CH}_3\text{CH}_2\text{COOH}$

18. Which reaction can be used to make ethanoic acid?

- A) oxidation of ethanol      C) reduction of ethanol  
B) oxidation of ethene      D) reduction of ethene

19. Substance Z has the following characteristics.

- 1 It burns in an excess of oxygen to form carbon dioxide and water.
- 2 It is oxidised by air to form a liquid smelling of vinegar.
- 3 It reacts with carboxylic acids to form esters.

**What is substance Z?**

- A) ethane      C) ethanol  
B) ethanoic acid      D) ethyl ethanoate

20. Which statements about aqueous ethanoic acid are correct?

- 1 It is an alkane.
- 2 It reacts with sodium carbonate to form carbon dioxide.
- 3 It changes the colour of litmus solution from blue to red.
- 4 It is a hydrocarbon.

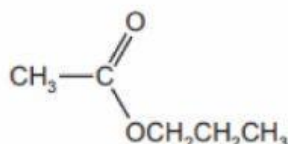
- A) 1 and 2      C) 2 and 3  
B) 1 and 4      D) 3 and 4

21. Which statements about aqueous ethanoic acid are correct?

- 1 It has a pH value of 10.
- 2 It reacts with metal carbonates to produce carbon dioxide gas.
- 3 It reacts with magnesium metal to produce hydrogen gas.

- A) 1, 2 and 3  
 B) 1 and 2 only  
 C) 1 and 3 only  
 D) 2 and 3 only

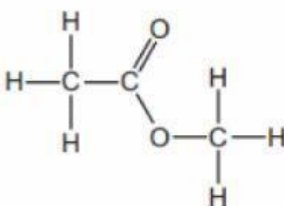
22. The structure of an ester is shown.



What is the name of the ester?

- A) ethyl propanoate  
 B) methyl propanoate  
 C) propyl ethanoate  
 D) propyl methanoate

23. The structure of ester W is shown.

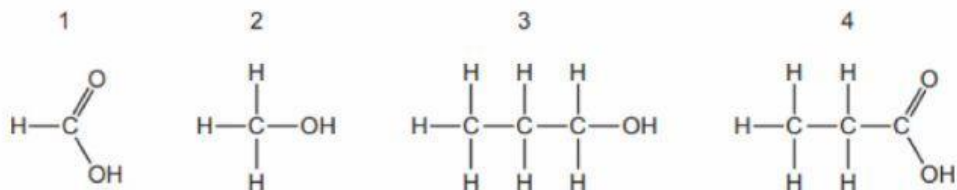


Which row gives the names of ester W and the carboxylic acid and alcohol from which it is made?

	name of ester W	carboxylic acid	alcohol
A	ethyl methanoate	ethanoic acid	methanol
B	ethyl methanoate	methanoic acid	ethanol
C	methyl ethanoate	ethanoic acid	methanol
D	methyl ethanoate	methanoic acid	ethanol

- A) A  
 B) B  
 C) C  
 D) D

24. The structure of four molecules are shown.



Which molecules react together to form the ester propyl methanoate?

- A) 1 and 2  
 B) 1 and 3  
 C) 2 and 4  
 D) 3 and 4
25. Which pair of compounds can be used to prepare  $\text{CH}_3\text{CH}_2\text{COOCH}_2\text{CH}_3$ ?

- A) ethanoic acid and ethanol  
 B) ethanoic acid and propanol  
 C) propanoic acid and ethanol  
 D) propanoic acid and propanol

26. Petroleum is separated into fractions by fractional distillation.

Separation occurs in a fractionating column.

Some properties of three of these fractions are shown.

fraction	boiling point range / °C	number of carbon atoms in the molecules
1		5-10
2	320-350	16-24
3	120-210	

Which statement is correct?

- A) Fraction 1 has a higher boiling point range than fraction 2.  
 B) Fraction 2 is removed from a higher point in the fractionating column than fraction 1.  
 C) Molecules in fraction 3 have shorter chains than those in fraction 2.  
 D) None of the fractions are liquid at room temperature.
27. Which substance is NOT a fraction obtained from the fractional distillation of petroleum?

- A) ethene  
 B) fuel oil  
 C) naphtha  
 D) refinery gas



28. Petroleum is separated by fractional distillation.

Which statement about the fractions produced is correct?

- A) Bottled gas for heating and cooking is obtained from the naphtha fraction.  
 B) Diesel oil is used as a fuel for jet aircraft.  
 C) Substances used to make polishes are obtained from the lubricating fraction.  
 D) The kerosene fraction contains many useful waxes.

29. Which products are obtained by the cracking of an alkane?

	alkene	hydrogen	water
A	✓	✓	✓
B	✓	✓	✗
C	✓	✗	✓
D	✗	✓	✓

- A) A  
 B) B  
 C) C  
 D) D

30. Some fractions obtained from petroleum are listed.

	fraction	use	position collected in the fractionating column
1	gasoline	waxes and polishes	below refinery gas
2	bitumen	making roads	above kerosene
3	kerosene	jet fuel	below gasoline
4	refinery gas	heating and cooking	above gasoline

Which rows are correct?

- A) 1, 3 and 4  
 B) 2, 3 and 4  
 C) 3 and 4  
 D) 4 only

31. Which statement is correct?

- A) Bitumen is used as a fuel for ships.  
 B) Coal, natural gas and oxygen are all fuels.  
 C) Hydrogen is the main constituent of natural gas.  
 D) Petroleum is separated into useful substances by fractional distillation.

32. Which list shows the fractions obtained from distilling petroleum, in order of increasing boiling point?

- A) bitumen → diesel oil → fuel oil → lubricating oil  
 B) diesel oil → gasoline → naphtha → kerosene  
 C) gasoline → naphtha → kerosene → diesel oil  
 D) kerosene → lubricating oil → naphtha → refinery gas