

For more topical worksheets and revision notes visit exambuddy.org

1. 5070/11/M/J/18 Q10

When 1 volume of gas **R** reacts with exactly 5 volumes of oxygen, it forms carbon dioxide and water only.

What is **R**?

- A** butane, C_4H_{10}
- B** ethane, C_2H_6
- C** methane, CH_4
- D** propane, C_3H_8

2. 5070/11/M/J/18 Q36

Which formula represents an alkane?

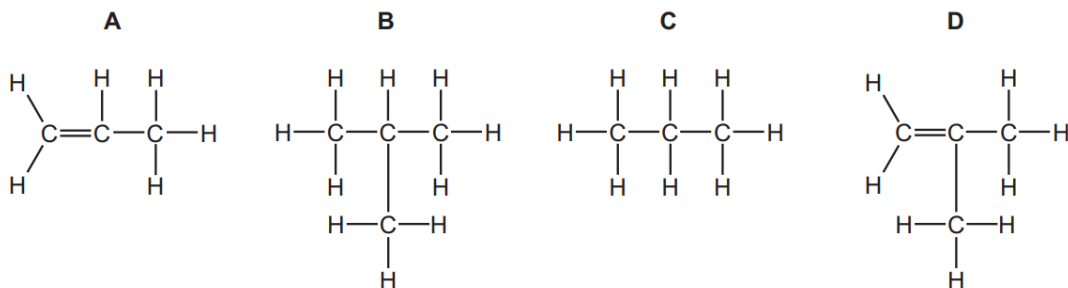
- A** $C_{31}H_{33}$ **B** $C_{31}H_{60}$ **C** $C_{31}H_{62}$ **D** $C_{31}H_{64}$

3. 5070/11/M/J/18 Q37

Z is a compound that:

- can be formed, as the only other product, when the alkane C_8H_{18} is cracked to produce butane
- decolourises bromine water
- has a branched chain structure.

What is the formula of **Z**?

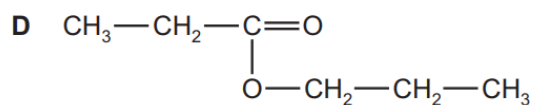
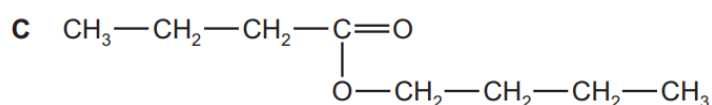
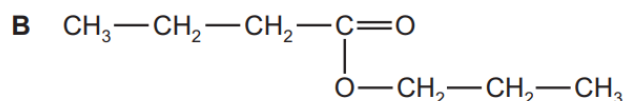
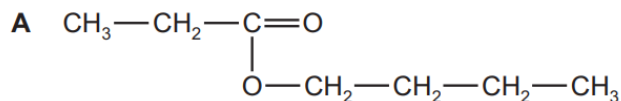


For more topical worksheets and revision notes visit exambuddy.org

4. 5070/11/M/J/18 Q38

A carboxylic acid of molecular formula $C_4H_8O_2$ reacts with an alcohol of molecular formula C_3H_8O to form an ester.

What could be the formula of the ester formed?



5. 5070/11/M/J/18 Q39

Some properties of compound **J** are listed.

- It reacts with potassium carbonate to produce carbon dioxide.
- It reacts with ethanol to produce a sweet-smelling liquid.
- It reacts with sodium hydroxide to produce a salt.

What is a possible identity of **J**?

- A ethanoic acid
- B ethanol
- C ethyl ethanoate
- D ethyl methanoate

6. 5070/12/M/J/18 Q10

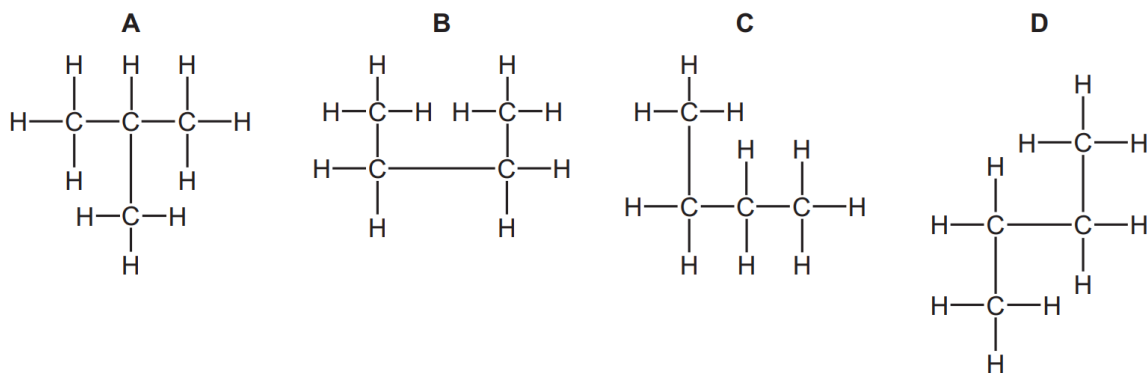
When 1 volume of gas **R** reacts with exactly 5 volumes of oxygen, it forms carbon dioxide and water only.

What is **R**?

- A butane, C_4H_{10}
- B ethane, C_2H_6
- C methane, CH_4
- D propane, C_3H_8

7. 5070/12/M/J/18 Q36

Which diagram shows a branched-chain isomer of butane?



8. 5070/12/M/J/18 Q37

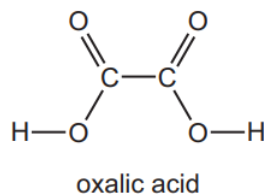
A straight-chain alkene, C_4H_8 , undergoes an addition reaction with bromine.

What is the possible structure of the product?

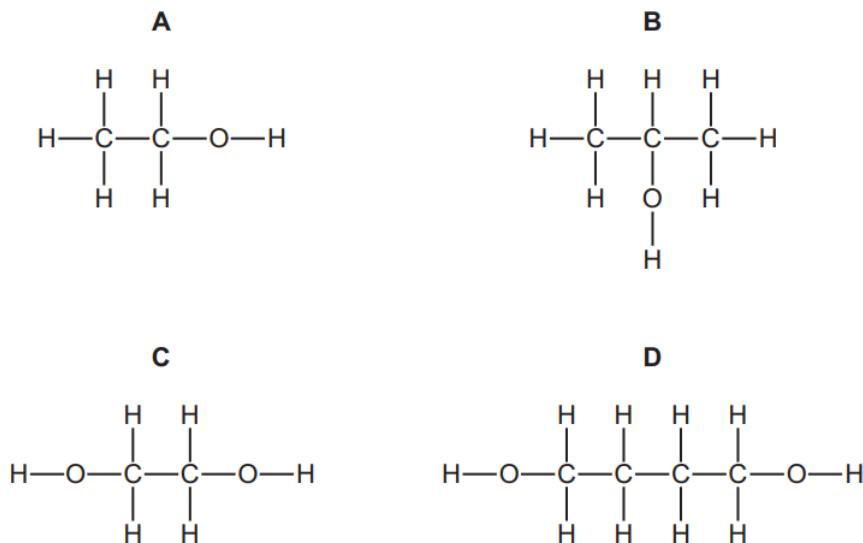
- A** $CH_3CHBrCH_2CH_2Br$
- B** $CH_3CHBrCHBrCH_3$
- C** $CH_2BrCH_2CH_2CH_2Br$
- D** $CH_3CH_2CH_2CH_2Br$

9. 5070/12/M/J/18 Q38

The diagram shows the structure of oxalic acid.



Which alcohol is oxidised to form oxalic acid?



For more topical worksheets and revision notes visit exambuddy.org

10. 5070/12/M/J/18 Q39

Some properties of compound **J** are listed.

- It reacts with potassium carbonate to produce carbon dioxide.
- It reacts with ethanol to produce a sweet-smelling liquid.
- It reacts with sodium hydroxide to produce a salt.

What is a possible identity of **J**?

- A** ethanoic acid
- B** ethanol
- C** ethyl ethanoate
- D** ethyl methanoate

11. 5070/11/O/N/18 Q34

How many of the molecules shown belong to the homologous series of alkanes?



A 1

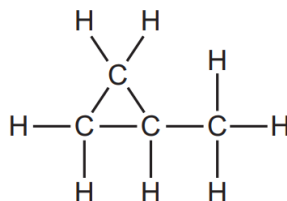
B 2

C 3

D 4

12. 5070/11/O/N/18 Q35

The diagram shows the structural formula of an organic compound.



Which statement about this compound is correct?

- A** It is a saturated hydrocarbon.
- B** It is an alkene.
- C** It is an isomer of butane.
- D** It will undergo addition with hydrogen.

13. 5070/11/O/N/18 Q36

Which statement about vegetable oil and the margarine made from it is correct?

- A Both are liquids at room temperature.
- B Both occur naturally.
- C Margarine has the higher melting point.
- D Vegetable oil has fewer carbon-carbon double bonds than margarine.

14. 5070/11/O/N/18 Q37

Which group is found in alcohols?

- A C=C B CO₂H C CONH D OH

15. 5070/11/O/N/18 Q38

An ester is formed from a carboxylic acid and an alcohol.

How does the number of carbon, hydrogen and oxygen atoms in an ester differ from the total number of these atoms in the carboxylic acid and alcohol from which the ester is formed?

	carbon atoms	hydrogen atoms	oxygen atoms
A	fewer	fewer	fewer
B	fewer	same	fewer
C	same	fewer	fewer
D	same	same	same

16. 5070/12/O/N/18 Q34

Which statement about the homologous series of alkanes is correct?

- A Alkanes are unsaturated hydrocarbons.
- B Alkanes all have the general formula C_nH_{2n}.
- C The boiling points decrease as the number of carbon atoms per molecule increases.
- D The liquid alkanes become more viscous as the mass of the molecules increases.

17. 5070/12/O/N/18 Q35

Which compound has the empirical formula with the greatest relative formula mass?

- A C₂H₆ B C₄H₁₀ C C₅H₁₀ D C₆H₆

18. 5070/12/O/N/18 Q36

Which statement about vegetable oil and the margarine made from it is correct?

- A Both are liquids at room temperature.
- B Both occur naturally.
- C Margarine has the higher melting point.
- D Vegetable oil has fewer carbon-carbon double bonds than margarine.

19. 5070/12/O/N/18 Q37

When ethene reacts with steam to form ethanol, which type of reaction takes place?

- A addition
- B fermentation
- C polymerisation
- D reduction

20. 5070/12/O/N/18 Q38

An ester is formed from a carboxylic acid and an alcohol.

How does the number of carbon, hydrogen and oxygen atoms in an ester differ from the total number of these atoms in the carboxylic acid and alcohol from which the ester is formed?

	carbon atoms	hydrogen atoms	oxygen atoms
A	fewer	fewer	fewer
B	fewer	same	fewer
C	same	fewer	fewer
D	same	same	same

21. 5070/11/M/J/19 Q33

Compound **Q** is a hydrocarbon that has no isomers. Compound **Q** does not decolourise bromine in the dark.

Which compound could be **Q**?

- A C_3H_6 B C_3H_8 C C_4H_8 D C_4H_{10}

22. 5070/11/M/J/19 Q34

Which organic compound requires the least number of moles of oxygen for the complete combustion of one mole of the compound?

- A C_3H_7OH B C_3H_7COOH C C_3H_8 D C_4H_8

23. 5070/11/M/J/19 Q35

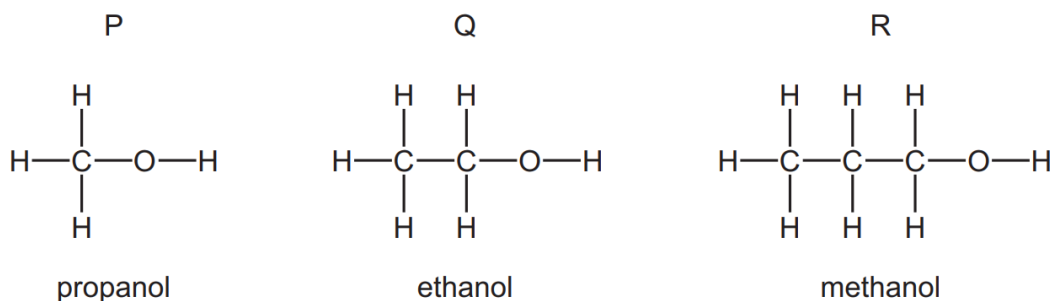
When a molecule of a saturated hydrocarbon is cracked, it forms two molecules X and Y.

Which row is correct?

	X	Y
A	H ₂	C _n H _{2n}
B	H ₂	C _n H _{2n+2}
C	H ₂ O	C _n H _{2n}
D	H ₂ O	C _n H _{2n+2}

24. 5070/11/M/J/19 Q36

The structures and names of three alcohols, P, Q and R are shown. The structures may not be named correctly.



Which structures are correctly named?

- A** P, Q and R **B** P only **C** Q only **D** R only

25. 5070/11/M/J/19 Q37

What is the empirical formula of ethanoic acid?

- A** CH₂O **B** CH₄O **C** C₂H₃O **D** C₂H₄O₂

26. 5070/11/M/J/19 Q38

What is the structure of propyl methanoate?

- A** CH₃COOCH₂CH₂CH₃
B CH₃COOCCH₂CH₃
C CH₃CH₂COOCH₃
D CH₃CH₂CH₂OOCH

For more topical worksheets and revision notes visit exambuddy.org

27. 5070/12/M/J/19 Q33

A molecule of compound Q has three C–C single bonds and ten C–H bonds only. It has no other bonds.

Which statement about compound Q is correct?

- A It can be polymerised.
- B It decolourises bromine water.
- C It has three isomers.
- D It reacts with chlorine by substitution.

28. 5070/12/M/J/19 Q34

Which organic compound requires the least number of moles of oxygen for the complete combustion of one mole of the compound?

- A C_3H_7OH B C_3H_7COOH C C_3H_8 D C_4H_8

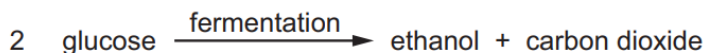
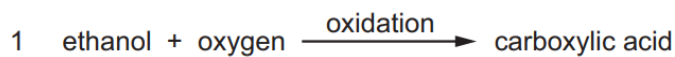
29. 5070/12/M/J/19 Q35

Which reaction is an addition reaction?

- A making ethane and ethene from butane
- B making ethene and hydrogen from butane
- C the manufacture of margarine from a vegetable oil
- D the reaction between ethene and oxygen, giving carbon dioxide and water

30. 5070/12/M/J/19 Q36

Two equations involving ethanol are shown.



Which row is correct?

	molecular formula of carboxylic acid in 1	a catalyst is needed
A	CH_3CO_2H	1 only
B	$C_2H_5CO_2H$	1 only
C	CH_3CO_2H	2 only
D	$C_2H_5CO_2H$	2 only

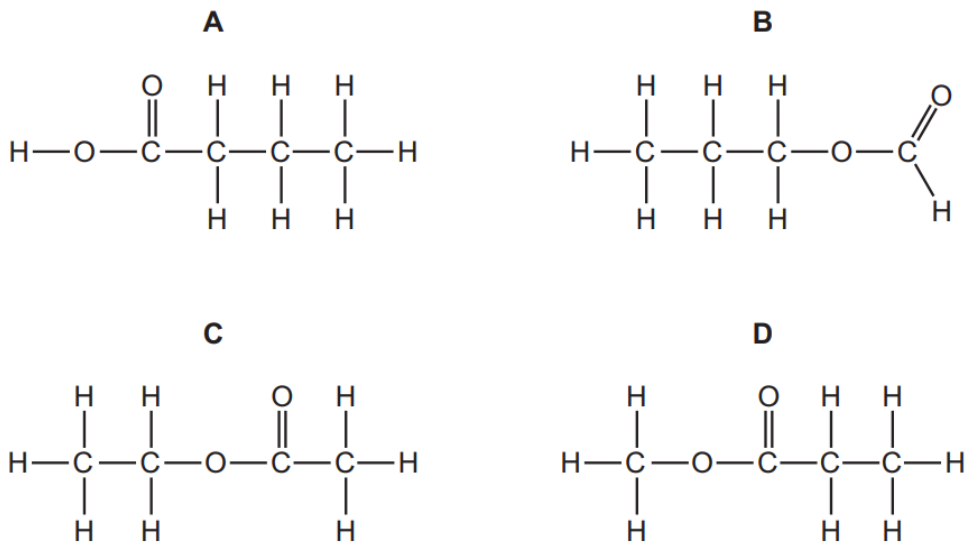
31. 5070/12/M/J/19 Q37

What is the empirical formula of ethanoic acid?

- A** CH₂O **B** CH₄O **C** C₂H₃O **D** C₂H₄O₂

32. 5070/12/M/J/19 Q38

Which structure represents propyl methanoate?



33. 5070/11/O/N/19 Q32

Which statements are true for homologous series?

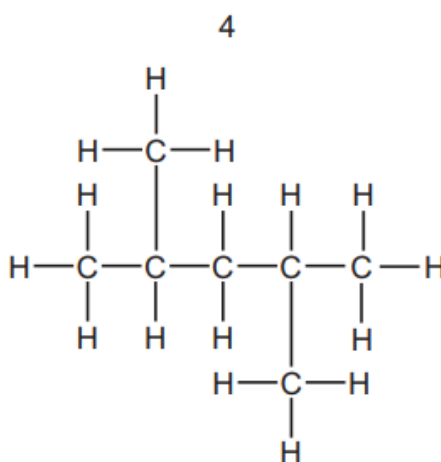
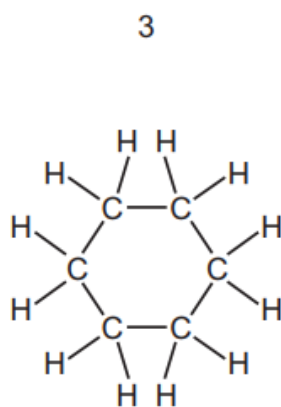
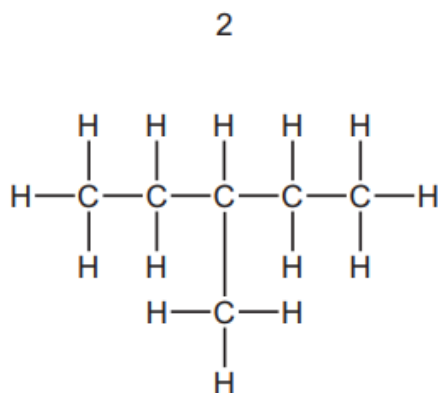
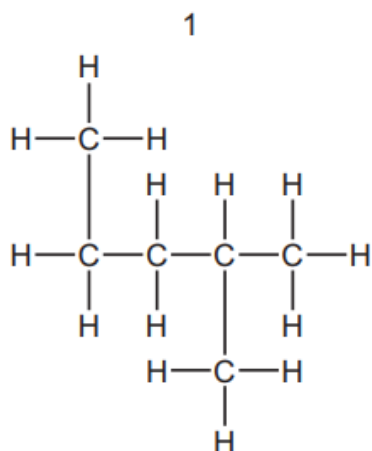
- 1 Each series contains saturated compounds.
- 2 The compounds in each series are unreactive.
- 3 Each series has a general formula.
- 4 Each series has a gradation in physical properties.

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

34. 5070/11/O/N/19 Q33

Alkanes are saturated compounds containing carbon and hydrogen only.

Structures 1, 2, 3 and 4 are saturated hydrocarbons.



Which pair of structures are isomers?

A 1 and 2

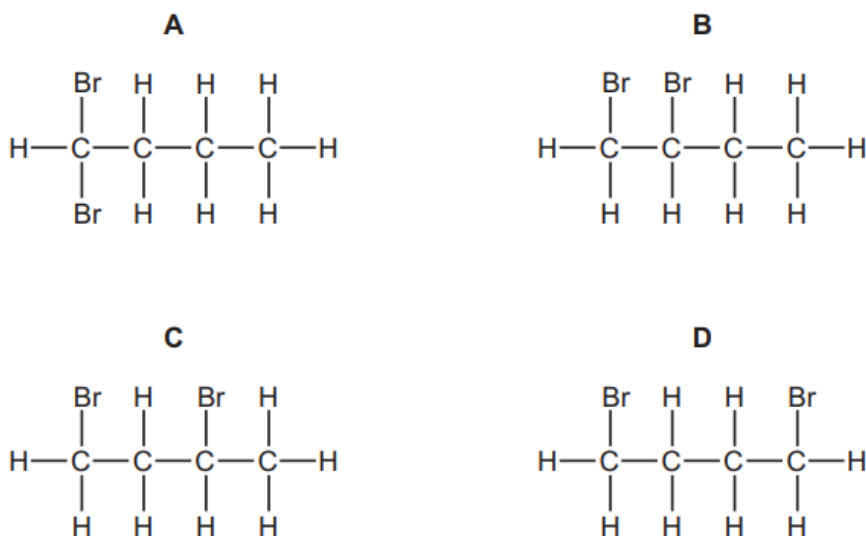
B 1 and 4

C 2 and 3

D 2 and 4

35. 5070/11/O/N/19 Q34

When butene reacts with bromine, which compound could be made?



36. 5070/11/O/N/19 Q35

How many structural isomers with the formula $\text{C}_4\text{H}_{10}\text{O}$ are alcohols?

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

37. 5070/11/O/N/19 Q36

Which statements about the alcohol $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ are correct?

- 1 When $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ is oxidised, it forms propanoic acid.
- 2 $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ burns in the air to form carbon dioxide and water.
- 3 $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ can be formed by the addition reaction between ethene and steam.

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

38. 5070/11/O/N/19 Q37

Propanoic acid reacts with calcium carbonate. The products of this reaction are calcium propanoate, carbon dioxide and water.

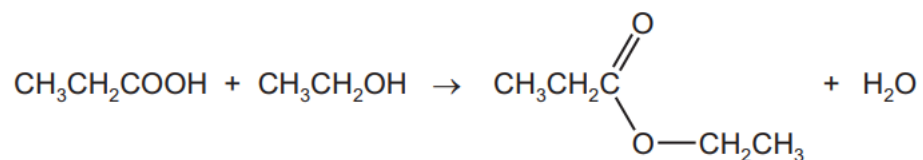
What is the equation for this reaction?

- A** $2\text{C}_2\text{H}_5\text{COOH} + \text{Ca}_2\text{CO}_3 \rightarrow 2\text{C}_2\text{H}_5\text{COOCa} + \text{CO}_2 + \text{H}_2\text{O}$
- B** $2\text{C}_2\text{H}_5\text{COOH} + \text{CaCO}_3 \rightarrow (\text{C}_2\text{H}_5\text{COO})_2\text{Ca} + \text{CO}_2 + \text{H}_2\text{O}$
- C** $2\text{C}_3\text{H}_7\text{COOH} + \text{Ca}_2\text{CO}_3 \rightarrow 2\text{C}_3\text{H}_7\text{COOCa} + \text{CO}_2 + \text{H}_2\text{O}$
- D** $2\text{C}_3\text{H}_7\text{COOH} + \text{CaCO}_3 \rightarrow (\text{C}_3\text{H}_7\text{COO})_2\text{Ca} + \text{CO}_2 + \text{H}_2\text{O}$

For more topical worksheets and revision notes visit exambuddy.org

39. 5070/11/O/N/19 Q38

An acid reacts with an alcohol to form an ester and water.



What is the name of the ester formed in this reaction?

- A** ethyl ethanoate
- B** ethyl propanoate
- C** propyl ethanoate
- D** propyl propanoate

40. 5070/12/O/N/19 Q32

A student investigates the properties of a colourless organic liquid.

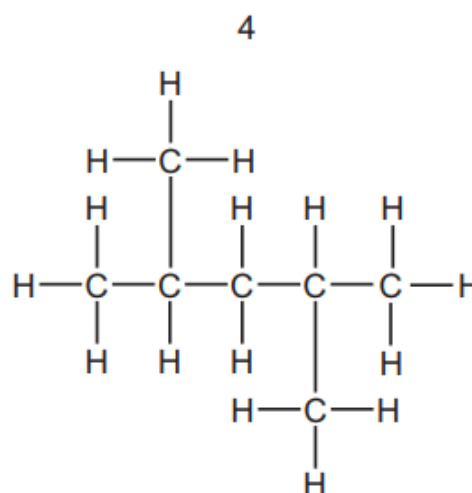
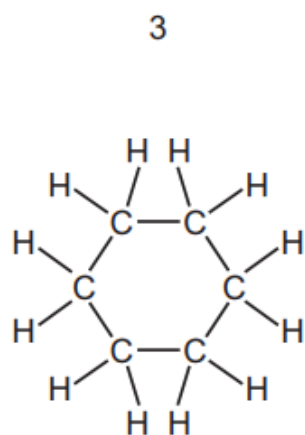
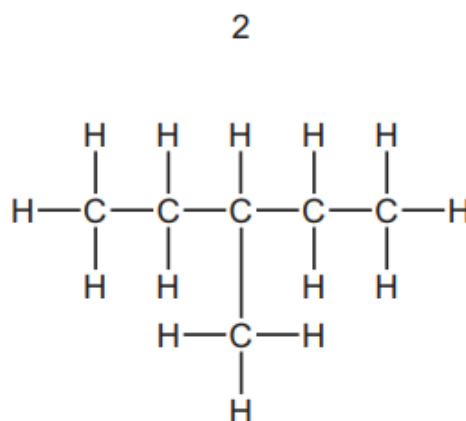
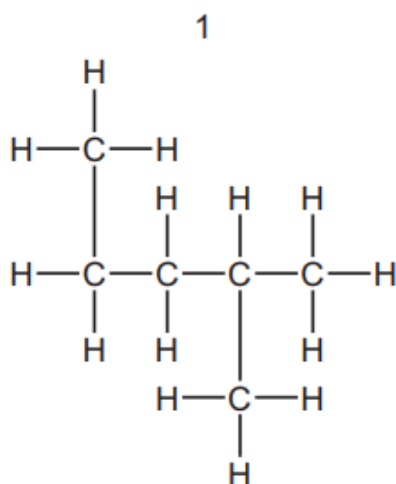
Which observation shows that the liquid is unsaturated?

- A** It decolourises aqueous bromine.
- B** It has a sweet smell.
- C** It is a good solvent for organic compounds.
- D** It produces carbon dioxide when burned.

41. 5070/12/O/N/19 Q33

Alkanes are saturated compounds containing carbon and hydrogen only.

Structures 1, 2, 3 and 4 are saturated hydrocarbons.



Which pair of structures are isomers?

A 1 and 2

B 1 and 4

C 2 and 3

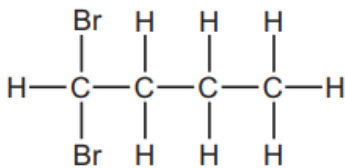
D 2 and 4

For more topical worksheets and revision notes visit exambuddy.org

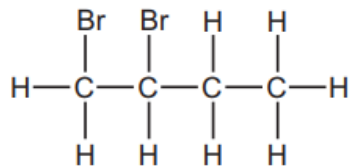
42. 5070/12/O/N/19 Q34

When butene reacts with bromine, which compound could be made?

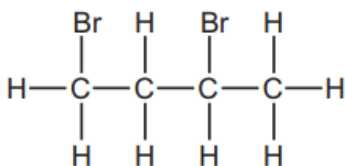
A



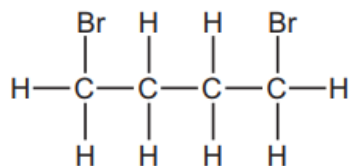
B



C



D



43. 5070/12/O/N/19 Q35

Which statement about propene is correct?

- A** It can be formed by cracking butane.
- B** It has the formula C_3H_8 .
- C** It is a saturated hydrocarbon.
- D** It reacts with hydrogen to form ethane.

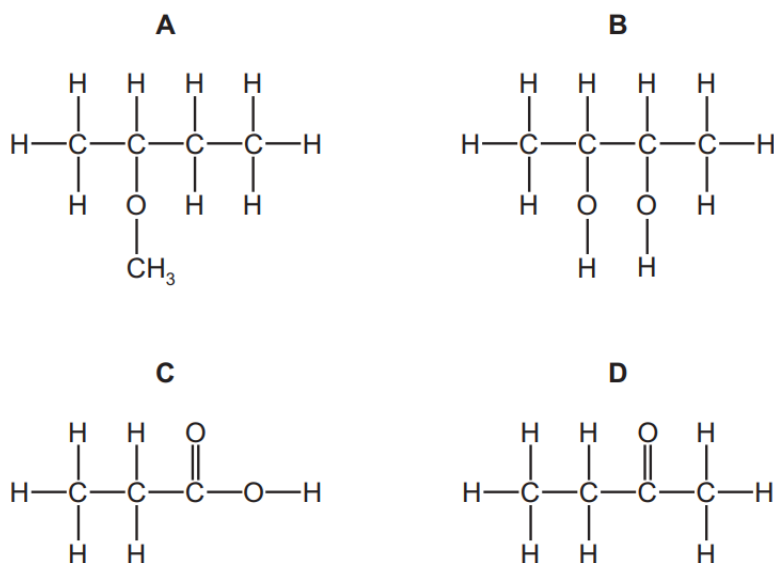
44. 5070/12/O/N/19 Q37

Which process is involved in the formation of ethanol from ethene?

- A addition
- B combustion
- C polymerisation
- D substitution

45. 5070/12/O/N/19 Q38

Which compound is an alcohol?



46. 5070/12/O/N/19 Q39

Which two compounds react together to form $\text{CH}_3\text{CH}_2\text{COOCH}_3$?

- A ethanoic acid and ethanol
- B methanoic acid and ethanol
- C methanoic acid and propanol
- D propanoic acid and methanol

47. 5070/12/O/N/19 Q40

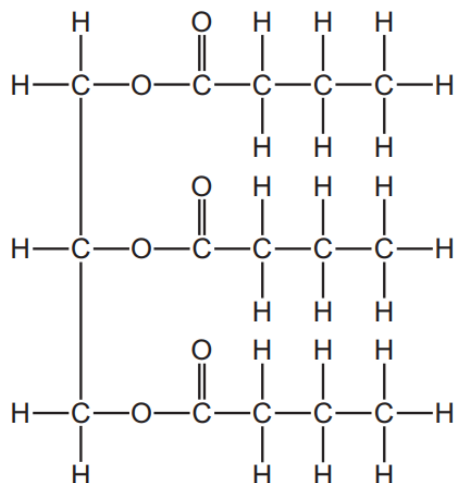
Which compound might be suitable to flavour a soft drink?

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

48. 5070/11/M/J/20 Q33

Fats are essential components of the human diet.

The diagram shows a fat molecule.

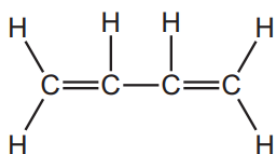


Which description of this fat molecule is correct?

- A saturated carboxylic acid
- B saturated ester
- C unsaturated carboxylic acid
- D unsaturated ester

49. 5070/11/M/J/20 Q34

A molecule of the compound C_4H_6 is shown.



This molecule undergoes an addition reaction with excess bromine and an addition reaction with steam.

One molecule of C_4H_6 reacts with1..... of bromine.

When C_4H_6 reacts with steam,2..... is formed.

Which words complete gaps 1 and 2?

	1	2
A	one molecule	an alcohol
B	one molecule	a carboxylic acid
C	two molecules	an alcohol
D	two molecules	a carboxylic acid

50. 5070/11/M/J/20 Q35

The molecules of two hydrocarbon compounds X and Y each contain only four carbon atoms.

X is saturated and Y is unsaturated.

Which statements are correct?

- 1 Under suitable conditions Y polymerises.
- 2 The complete combustion of 1 mole of Y produces more carbon dioxide than the complete combustion of 1 mole of X.
- 3 One molecule of Y contains more hydrogen atoms than one molecule of X.

A 1 only **B** 3 only **C** 1 and 2 **D** 2 and 3

51. 5070/11/M/J/20 Q36

Which conversions involve oxidation?

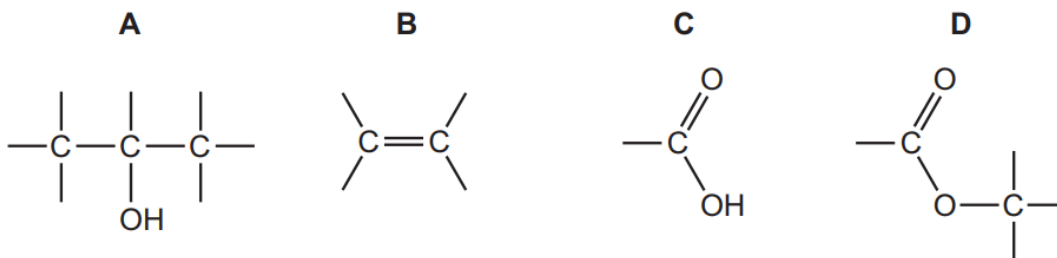
- 1 ethanol → carbon dioxide + water
- 2 ethanol → ethanoic acid
- 3 ethene → poly(ethene)

A 1 only **B** 2 only **C** 1 and 2 only **D** 1, 2 and 3

52. 5070/11/M/J/20 Q37

Compound T reacts with magnesium, aqueous sodium hydroxide and ethanol.

Which group does T contain?



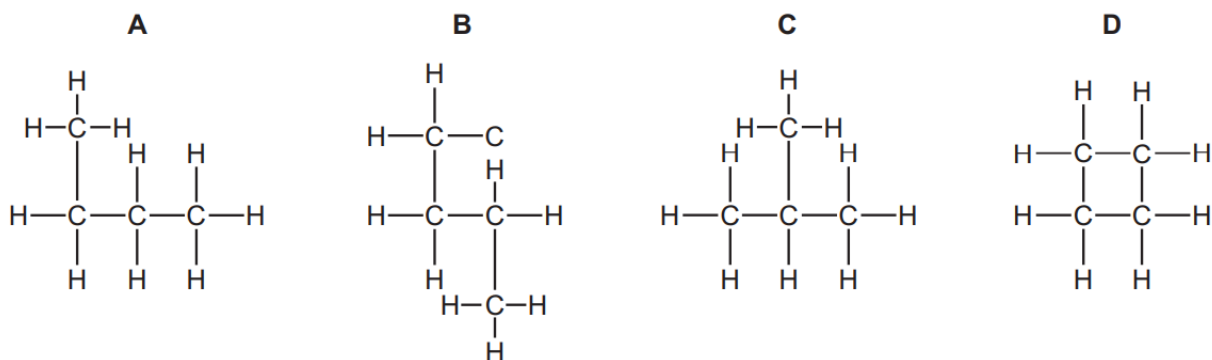
53. 5070/11/M/J/20 Q38

Which type of reaction could be used in the polymerisation of ethene?

- A** addition
B condensation
C cracking
D esterification

54. 5070/12/M/J/20 Q33

Which structure represents an isomer of butane?



55. 5070/12/M/J/20 Q34

Which statement about the organic compounds CH_4 , C_2H_4 , C_2H_6 and C_3H_8 is correct?

- A Only C_2H_4 and C_2H_6 decolourise bromine water.
- B They are all saturated compounds.
- C They are all unsaturated compounds.
- D They are all hydrocarbons.

56. 5070/12/M/J/20 Q35

The alkenes are a homologous series.

Which statement about alkenes is correct?

- A An alkene molecule contains four fewer hydrogen atoms than an alkane molecule with the same number of carbon atoms.
- B If a food is described as *polyunsaturated* it means that it contains polymers.
- C Propene reacts with steam to form propanol.
- D The general formula for the alkenes is $\text{C}_n\text{H}_{2n+2}$.

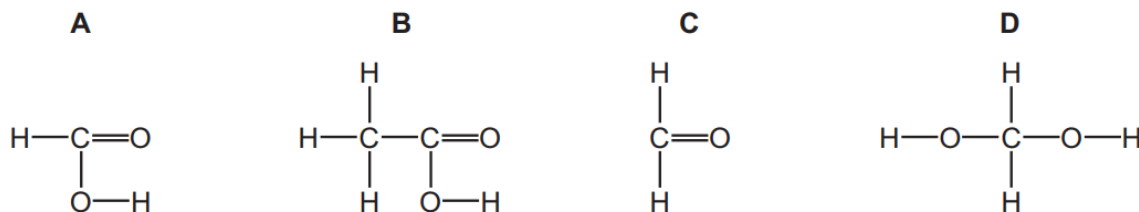
57. 5070/12/M/J/20 Q36

Which organic compound is used as a solvent, a renewable fuel and in the production of vinegar?

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

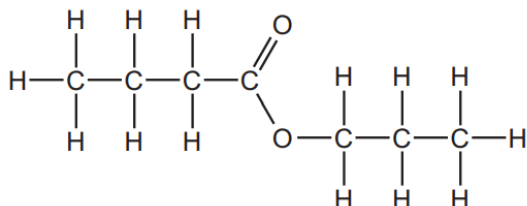
58. 5070/12/M/J/20 Q37

Which structure shows the carboxylic acid with the lowest relative molecular mass?



59. 5070/12/M/J/20 Q38

What is the name of the ester shown?



- A butyl propanoate
- B propyl butanoate
- C propyl ethanoate
- D propyl propanoate

60. 5070/11/O/N/20 Q34

Chlorine reacts with methane.

Which row is correct?

	chemical equation	conditions required
A	$Cl_2 + CH_4 \rightarrow CH_2Cl_2 + H_2$	methane and chlorine gases are mixed in the presence of ultraviolet light
B	$Cl_2 + CH_4 \rightarrow CH_2Cl_2 + H_2$	methane is bubbled into concentrated aqueous chlorine
C	$Cl_2 + CH_4 \rightarrow CH_3Cl + HCl$	methane and chlorine gases are mixed in the presence of ultraviolet light
D	$Cl_2 + CH_4 \rightarrow CH_3Cl + HCl$	methane is bubbled into concentrated aqueous chlorine

61. 5070/11/O/N/20 Q35

Which statements about alkenes are correct?

- 1 They have the general formula of C_nH_{2n} .
- 2 They undergo addition reactions with steam.
- 3 They burn in air to form carbon dioxide and water.

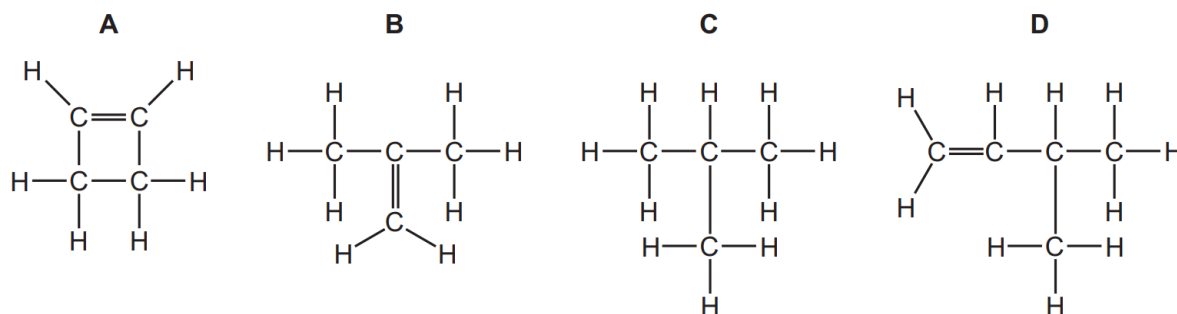
A 1 and 2 only **B** 1 and 3 only **C** 2 and 3 only **D** 1, 2 and 3

62. 5070/11/O/N/20 Q36

X is a branched hydrocarbon with the ratio of carbon atoms to hydrogen atoms being 1 : 2.

X has a relative molecular mass of 56.

What is the identity of X?



63. 5070/11/O/N/20 Q37

The reactions listed all involve ethanol.

- 1 $C_2H_5OH + O_2 \rightarrow CH_3COOH + H_2O$
- 2 $C_2H_5OH + CH_3COOH \rightarrow CH_3COOC_2H_5 + H_2O$
- 3 $C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2$

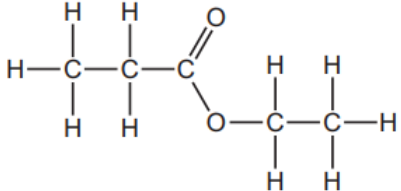
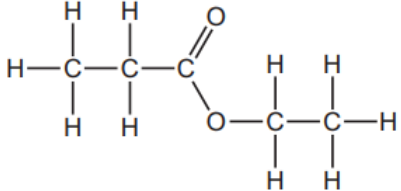
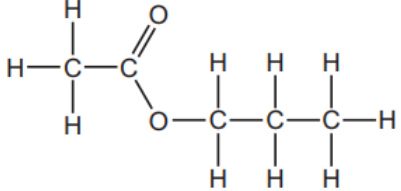
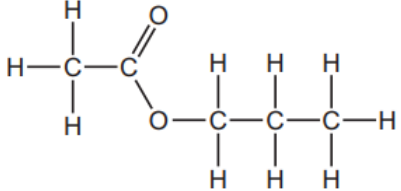
Which row correctly describes each reaction?

	1	2	3
A	combustion	acidification	fermentation
B	combustion	esterification	addition
C	oxidation	acidification	addition
D	oxidation	esterification	fermentation

64. 5070/11/O/N/20 Q38

Ethanoic acid is reacted with propanol.

What is the name and what is the structure of the ester produced?

	name	structure
A	propyl ethanoate	
B	ethyl propanoate	
C	propyl ethanoate	
D	ethyl propanoate	

65. 5070/12/O/N/20 Q34

Propane undergoes substitution reactions when mixed with chlorine gas in the presence of ultraviolet light.

Which compound could be formed when propane and chlorine are mixed in the presence of ultraviolet light?

- A** $\text{CH}_3\text{CCl}_2\text{CH}_3$
- B** $\text{CH}_2\text{ClCH}_2\text{Cl}$
- C** $\text{CH}_3\text{CH}_2\text{CH}_3\text{Cl}$
- D** $\text{CH}_3\text{CHClCH}_2\text{CH}_3$

For more topical worksheets and revision notes visit exambuddy.org

66. 5070/12/O/N/20 Q35

The hydrocarbon CH_3CHCH_2 will undergo a number of chemical reactions.

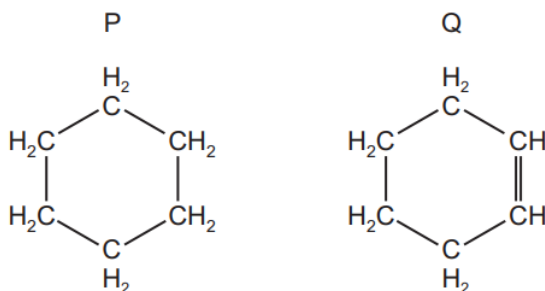
In which reaction will the carbon to carbon single bond be broken?

- A** combustion with oxygen
- B** hydrogenation
- C** polymerisation
- D** reaction with steam

67. 5070/12/O/N/20 Q36

Hydrocarbon compounds can form rings of carbon atoms as well as chains.

The structures of two hydrocarbon rings are shown.



Which of P and Q is unsaturated and which reacts with aqueous bromine?

	is unsaturated	reacts with aqueous bromine
A	P	P
B	P	Q
C	Q	P
D	Q	Q

68. 5070/12/O/N/20 Q37

A sample of aqueous glucose is fermented with yeast at 37°C in the absence of air.

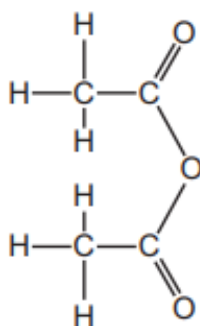
The main organic product, X, is purified by fractional distillation. X is then oxidised, by heating under reflux with acidified potassium manganate(VII), to give a final product Y.

What is the identity of Y?

- A** ethanoic acid
- B** ethene
- C** propanoic acid
- D** propene

69. 5070/12/O/N/20 Q38

The diagram shows the structure of a compound called ethanoic anhydride.



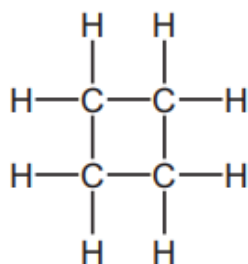
1 mol of ethanoic anhydride reacts with water to form 2 mol of a carboxylic acid only. This carboxylic acid reacts with ethanol to form an ester.

How many moles of water react with 1 mol of the ethanoic anhydride and what is the structure of the ester?

	number of moles of water	structure of the ester
A	1	
B	1	
C	2	
D	2	

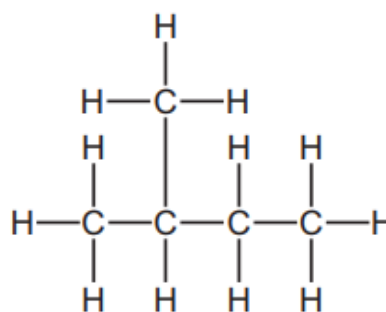
The structures and names of four alkanes are given.

1



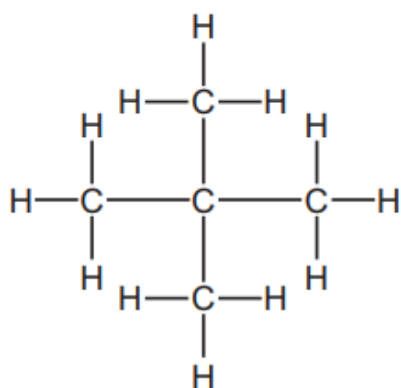
cyclobutane

2



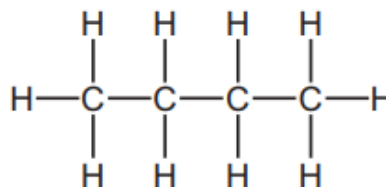
methylbutane

3



dimethylpropane

4



butane

Which two alkanes are isomers of each other?

A 1 and 3

B 1 and 4

C 2 and 3

D 2 and 4

71. 3173/12/M/J/21 Q37

A hydrocarbon, C_xH_y , undergoes an addition reaction with chlorine.

A second hydrocarbon, C_pH_q , undergoes a substitution reaction with chlorine.

If $x = 4$ and $p = 6$, what are the values of y and q ?

	y	q
A	8	16
B	8	14
C	10	12
D	10	14

72. 3173/12/M/J/21 Q38

An organic compound has an empirical formula C_2H_4O .

What could the compound be?

- A** butanoic acid
- B** butanol
- C** ethanoic acid
- D** ethanol

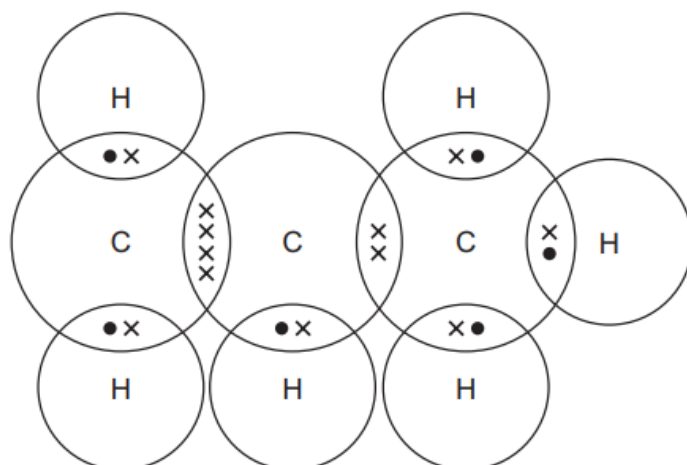
73. 5070/11/M/J/21 Q35

How many moles of hydrogen chloride are formed when one mole of methane reacts with a large excess of chlorine in sunlight?

- A** 1 **B** 2 **C** 3 **D** 4

74. 5070/11/M/J/21 Q36

Compound X is shown in the dot-and-cross diagram.



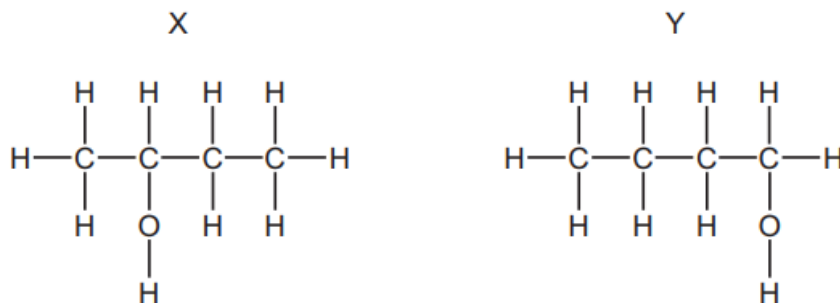
Which statement about compound X is correct?

- A It is a saturated hydrocarbon.
- B It is an isomer of butene.
- C It will decolourise bromine water.
- D Its name is propane.

75. 5070/11/M/J/21 Q37

Which statements about alcohols are correct?

- 1 All alcohols contain the hydroxide ion, OH^- .
- 2 Ethanol can be formed from ethene using a reaction catalysed by yeast.
- 3 Methanol can be oxidised to methanoic acid.
- 4 The alcohols X and Y shown are isomers.



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

76. 5070/11/M/J/21 Q38

An ester has the formula $C_2H_5COOC_2H_5$.

Which pair of compounds would react together to form this ester?

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

77. 5070/12/M/J/21 Q35

How many moles of hydrogen chloride are formed when one mole of methane reacts with a large excess of chlorine in sunlight?

- A 1 B 2 C 3 D 4

78. 5070/12/M/J/21 Q36

Vegetable oils can be made into margarine.

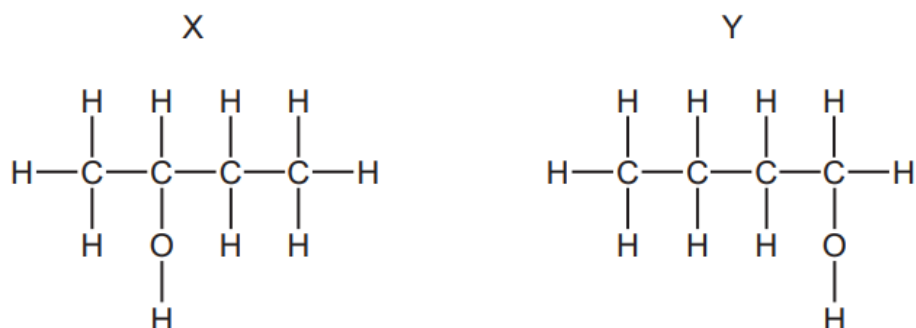
Which row describes the changes which take place?

	hydrogen	viscosity
A	is added	increases
B	is removed	decreases
C	is added	decreases
D	is removed	increases

79. 5070/12/M/J/21 Q37

Which statements about alcohols are correct?

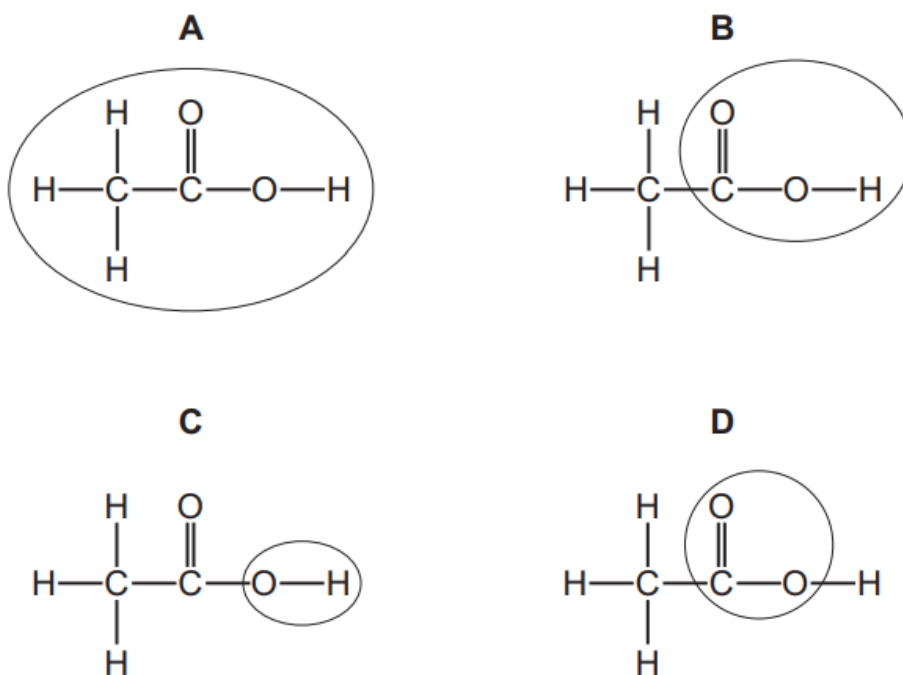
- 1 All alcohols contain the hydroxide ion, OH^- .
- 2 Ethanol can be formed from ethene using a reaction catalysed by yeast.
- 3 Methanol can be oxidised to methanoic acid.
- 4 The alcohols X and Y shown are isomers.



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

80. 5070/12/M/J/21 Q38

Which circled structure shows only the functional group of a carboxylic acid?



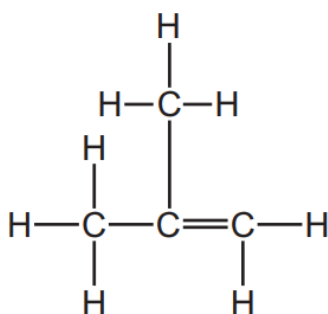
81. 5070/11/O/N/21 Q36

Which statement about alkanes is correct?

- A Alkanes are described as being saturated because they are insoluble in water.
- B Alkanes react with chlorine in an addition reaction.
- C The alkane containing 10 carbon atoms in each molecule has a higher viscosity than the alkane containing 20 carbon atoms.
- D The formula of an alkane with 35 carbon atoms in each molecule is $C_{35}H_{72}$.

82. 5070/11/O/N/21 Q37

The structure of compound X is shown.



Four statements are made about compound X.

- 1 X burns in air to form carbon dioxide and water.
- 2 X turns bromine water from colourless to brown.
- 3 X is propene.
- 4 The number of C–C single bonds is increased by reacting X with hydrogen.

Which statements are correct?

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

83. 5070/11/O/N/21 Q38

When ethene reacts with steam to form ethanol, which type of reaction takes place?

- A addition
- B fermentation
- C polymerisation
- D reduction

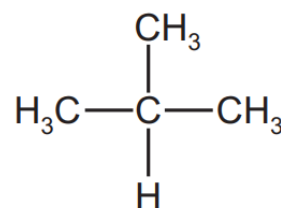
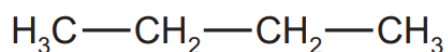
84. 5070/11/O/N/21 Q39

Which compound could be a flavouring in a non-alcoholic fruit drink?

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

85. 5070/12/O/N/21 Q36

Two isomers are shown.



Which statements about these isomers are correct?

- 1 They have the same empirical formula.
- 2 They have different molecular formulae.
- 3 They are members of the same homologous series.

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

86. 5070/12/O/N/21 Q37

A hydrocarbon compound Q has molecular formula C_xH_y .

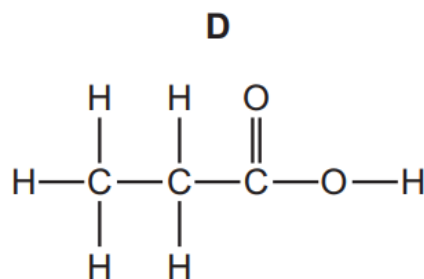
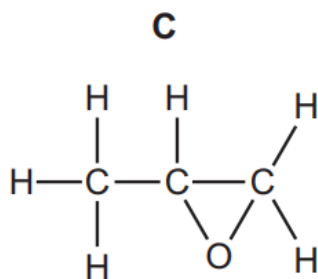
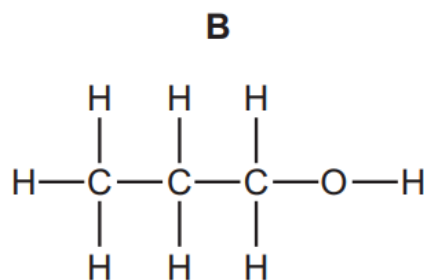
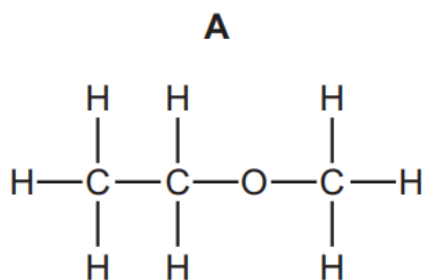
Q reacts with hydrogen to form a single product with molecular formula C_xH_{y+2} .

Which statement about Q is correct?

- A Q does not burn in air.
- B Q is a saturated hydrocarbon.
- C Q reacts with bromine to form a single product with molecular formula $C_xH_{y-1}Br$.
- D Q reacts with steam to form a single product with molecular formula $C_xH_{y+2}O$.

87. 5070/12/O/N/21 Q38

Which structural formula represents an alcohol?



88. 5070/12/O/N/21 Q39

Which statement about carboxylic acids is correct?

- A** They are prepared by the oxidation of alkanes.
- B** They decolourise bromine water.
- C** They react with alcohols to form esters.
- D** They react with carbonates to form a salt, hydrogen and water.

89. 5070/11/M/J/22 Q35

One mole of each of the compounds shown is completely combusted.

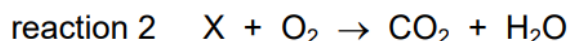
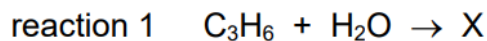


How many of the compounds need exactly nine moles of oxygen for complete combustion?

- A** 1
- B** 2
- C** 3
- D** 4

90. 5070/11/M/J/22 Q36

The reactants and products of two reactions are shown.



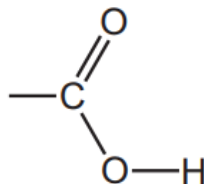
Which row correctly describes these two reactions?

	identity of compound X	conditions for reaction 1	reaction 2
A	butanol	high pressure and a catalyst	combustion
B	butanol	heat and a catalyst	decomposition
C	propanol	heat and a catalyst	decomposition
D	propanol	heat and a catalyst	combustion

91. 5070/11/M/J/22 Q37

Which statement about carboxylic acids is correct?

A All carboxylic acids include the group:



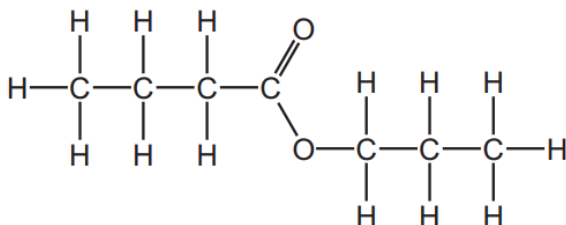
B Ethanoic acid reacts with both copper(II) oxide and copper.

C Methanoic acid, formed by bacterial oxidation, is present in vinegar.

D Propanoic acid decolourises acidified potassium manganate(VII).

92. 5070/11/M/J/22 Q38

The structure of an ester is shown.



What is the name of this ester?

A butyl butanoate

B butyl propanoate

C propyl butanoate

D propyl propanoate

93. 5070/12/M/J/22 Q34

The addition reaction between a hydrocarbon X and bromine forms only one product.

Which compound is X?

A CH₄

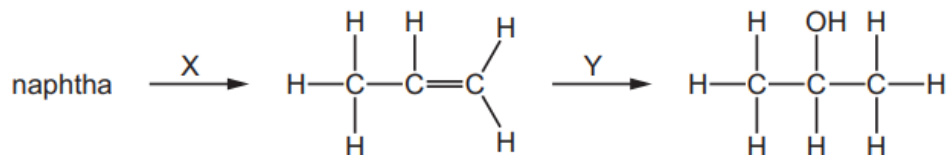
B C₂H₄

C C₂H₆

D CH₃OH

94. 5070/12/M/J/22 Q35

A series of reactions producing propanol from the naphtha fraction of petroleum (crude oil) is shown.

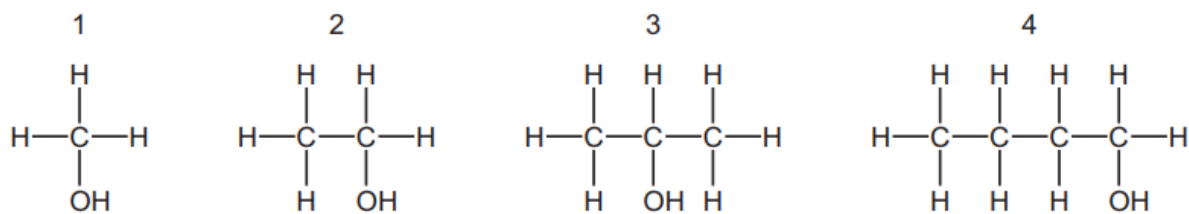


What are processes X and Y?

	X	Y
A	cracking	reaction with steam
B	cracking	fermentation
C	fractional distillation	reaction with steam
D	fractional distillation	fermentation

95. 5070/12/M/J/22 Q36

The structures of four alcohols are shown.



Which statement is correct?

- A** Alcohol 1 can be made by the addition of steam to an alkene.
- B** Alcohol 2 can be made from glucose.
- C** Alcohol 3 is a renewable energy source.
- D** Alcohol 4 has only one other isomer.

96. 5070/12/M/J/22 Q37

Which compounds have the molecular formula $\text{C}_3\text{H}_6\text{O}_2$?

- 1 methyl ethanoate
- 2 ethyl methanoate
- 3 propanoic acid

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

97. 5070/12/M/J/22 Q38

An organic compound has the empirical formula CH_2O .

Which row shows a possible correct name and structure for this compound?

	name	structure
A	methanol	$\begin{array}{c} \text{O} \\ \parallel \\ \text{H}-\text{C}-\text{H} \end{array}$
B	methanoic acid	$\begin{array}{c} \text{O} \\ \parallel \\ \text{H}-\text{C} \\ \diagdown \\ \text{O}-\text{H} \end{array}$
C	ethanol	$\begin{array}{c} \text{H} \quad \text{O} \\ \quad \parallel \\ \text{H}-\text{C}-\text{C}-\text{O}-\text{H} \\ \\ \text{H} \end{array}$
D	ethanoic acid	$\begin{array}{c} \text{H} \quad \text{O} \\ \quad \parallel \\ \text{H}-\text{C}-\text{C}-\text{O}-\text{H} \\ \\ \text{H} \end{array}$

98. 5070/11/O/N/22 Q36

Octane is an alkane with eight carbon atoms per molecule.

What is the molecular formula of octane, and how does its boiling point compare with that of butane?

	molecular formula of octane	boiling point of octane
A	C_8H_{16}	higher than butane
B	C_8H_{16}	lower than butane
C	C_8H_{18}	lower than butane
D	C_8H_{18}	higher than butane

99. 5070/11/O/N/22 Q37

Which equation for the reaction between propane and chlorine is correct?

- A $C_3H_6 + Cl_2 \rightarrow C_3H_6Cl_2$
- B $C_3H_8 + Cl_2 \rightarrow C_3H_6Cl_2 + H_2$
- C $C_3H_8 + Cl_2 \rightarrow CH_3Cl + C_2H_5Cl$
- D $C_3H_8 + Cl_2 \rightarrow C_3H_7Cl + HCl$

100. 5070/11/O/N/22 Q38

Propanoic acid reacts with calcium carbonate. The products of this reaction are calcium propanoate, carbon dioxide and water.

What is the equation for this reaction?

- A $2C_2H_5COOH + Ca_2CO_3 \rightarrow 2C_2H_5COOCa + CO_2 + H_2O$
- B $2C_2H_5COOH + CaCO_3 \rightarrow (C_2H_5COO)_2Ca + CO_2 + H_2O$
- C $2C_3H_7COOH + Ca_2CO_3 \rightarrow 2C_3H_7COOCa + CO_2 + H_2O$
- D $2C_3H_7COOH + CaCO_3 \rightarrow (C_3H_7COO)_2Ca + CO_2 + H_2O$

101. 5070/12/O/N/22 Q36

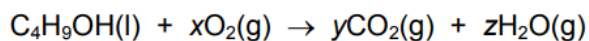
Which compound is an alkane?

- A $CH_2CHCH_2CH_3$
- B $CH_3CH(CH_3)CH_3$
- C $CH_3CHCHCH_3$
- D $(CH_3)_2CCH_2$

For more topical worksheets and revision notes visit exambuddy.org

102. 5070/12/O/N/22 Q37

The equation shows the reaction that takes place when butanol is completely combusted in air.



What are the values of x , y and z ?

	x	y	z
A	4	6	5
B	5	4	6
C	5	6	4
D	6	4	5

103. 5070/12/O/N/22 Q38

Propanoic acid reacts with calcium carbonate. The products of this reaction are calcium propanoate, carbon dioxide and water.

What is the equation for this reaction?

- A** $2\text{C}_2\text{H}_5\text{COOH} + \text{Ca}_2\text{CO}_3 \rightarrow 2\text{C}_2\text{H}_5\text{COOCa} + \text{CO}_2 + \text{H}_2\text{O}$
- B** $2\text{C}_2\text{H}_5\text{COOH} + \text{CaCO}_3 \rightarrow (\text{C}_2\text{H}_5\text{COO})_2\text{Ca} + \text{CO}_2 + \text{H}_2\text{O}$
- C** $2\text{C}_3\text{H}_7\text{COOH} + \text{Ca}_2\text{CO}_3 \rightarrow 2\text{C}_3\text{H}_7\text{COOCa} + \text{CO}_2 + \text{H}_2\text{O}$
- D** $2\text{C}_3\text{H}_7\text{COOH} + \text{CaCO}_3 \rightarrow (\text{C}_3\text{H}_7\text{COO})_2\text{Ca} + \text{CO}_2 + \text{H}_2\text{O}$