Hydrocarbons Multiple Choice

Question Paper 1

Level	A Level
Subject	Chemistry
Exam Board	OCR
Module	Core Organic Chemistry
Topic	Hydrocarbons
Paper	Multiple Choice
Booklet	Question Paper 1

Time allowed: **30 minutes**

Score: **/22**

Percentage: **/100**

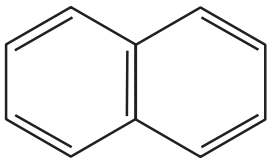
Grade Boundaries:

A*	A	B	C	D	E
>85%	73%	60%	47%	34%	21%

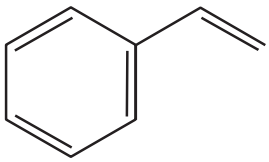
Question 1

Which structure represents an alicyclic compound? **[1]**

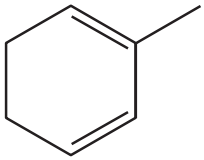
A



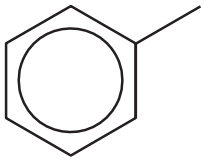
B



C



D



Question 2

How many structural isomers of $C_6H_{14}O$ are tertiary alcohols? **[1]**

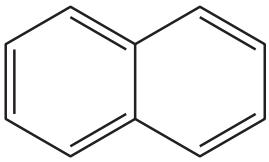
A. 1

B. 2

C. 3

D. 4

The structure of naphthalene is shown below.



What is the molecular formula of naphthalene? **[1]**

A $C_{10}H_8$

B $C_{10}H_{10}$

C $C_{12}H_{10}$

D $C_{12}H_{12}$

Question 4

A student reacts pent-2-ene with bromine in the laboratory.

Which compound is formed? **[1]**

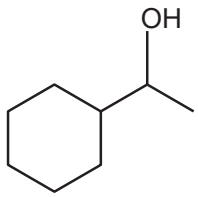
A 1,1-dibromopentane

B 1,2-dibromopentane

C 2,2-dibromopentane

D 2,3-dibromopentane

How can the molecule below be described? **[1]**



A. Aromatic and alicyclic

B. Aliphatic and unsaturated

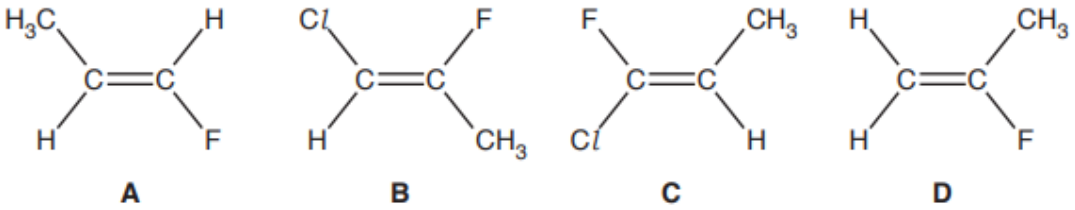
C. Aromatic and unsaturated

D. Alicyclic and saturated

Question 6

Which molecule is a *Z*-isomer?

[1]



Question 7

Ethane reacts with chlorine by radical substitution to form chloroethane.

Which radical(s) is/are present in the mechanism?

[1]

1 H•

2 C*l*•

3 C_2H_5•

A. 1, 2 and 3

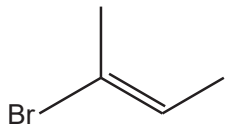
B. Only 1 and 2

C. Only 2 and 3

D. Only 1

Question 8

What is the systematic name of the compound below? **[1]**



A. *E*-2-bromobut-2-ene

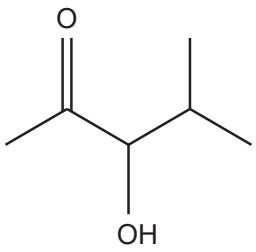
B. *Z*-2-bromobut-2-ene

C. *E*-1,2-dimethyl-1-bromoethene

D. *Z*-1,2-dimethyl-1-bromoethene

Question 9

The skeletal formula of an organic compound is shown below.



What is the molecular formula of the organic compound? **[1]**

A $C_6H_{10}O_2$

B $C_6H_{11}O_2$

C $C_6H_{12}O_2$

D $C_6H_{13}O_2$

Question 10

How many structural isomers have the molecular formula C_5H_{12}?

[1]

A. 2

B. 3

C. 4

D. 5

Question 11

Which organic compound has the lowest boiling point? **[1]**

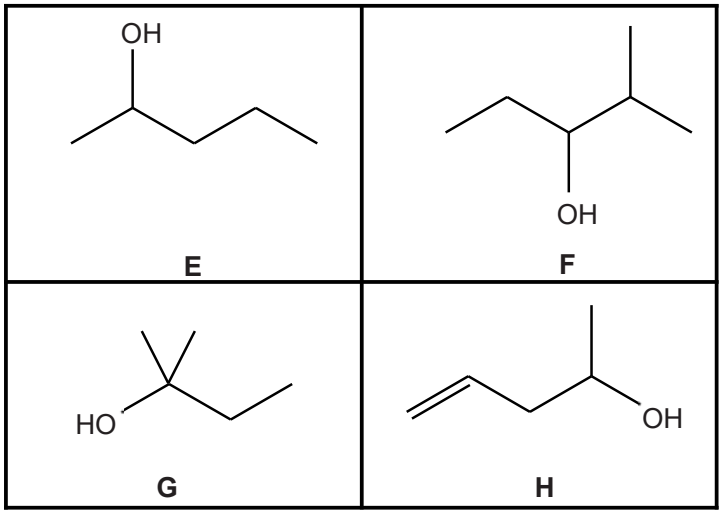
A. 2,3,4-trimethylpentane

B. 2,3-dimethylhexane

C. 2-methylheptane

D. octane

The skeletal formulae of four alcohols, **E**, **F**, **G** and **H**, are shown below.



Which pair of alcohols are structural isomers of each other? **[1]**

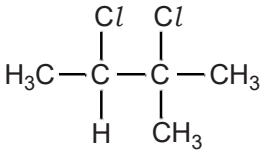
A. **E** and **F**

B. **E** and **G**

C. **E** and **H**

D. **F** and **G**

What is the name of the following compound? **[1]**



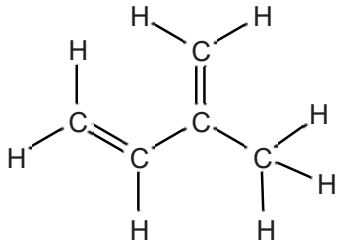
A. 1,2-dichloro-1,2-dimethylpropane

B. 2,3-dichloro-2,3-dimethylpropane

C. 2,3-dichloro-2-methylbutane

D. 2,3-dichloro-3-methylbutane

The displayed formula for a hydrocarbon is shown below.



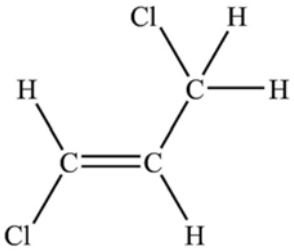
How many σ and π bonds are present in a molecule of this hydrocarbon? **[1]**

	σ bonds	**π bonds**
A	2	4
B	10	2
C	10	4
D	12	2

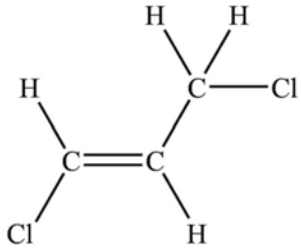
Three of the following displayed formulae represent the same isomer of $C_3H_4Cl_2$ but one structure represents a different isomer, **X**.

Which displayed formula represents **X**? **[1]**

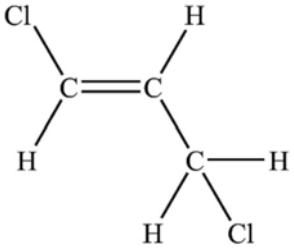
A



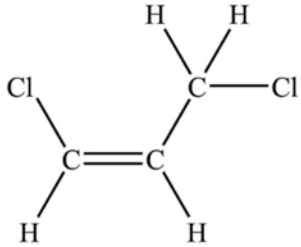
B



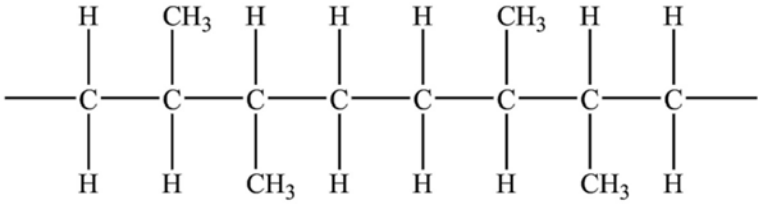
C



D



A section of a polymer chain is shown below.



Identify the monomer that would give rise to this section of addition polymer. **[1]**

A *E*-But-2-ene

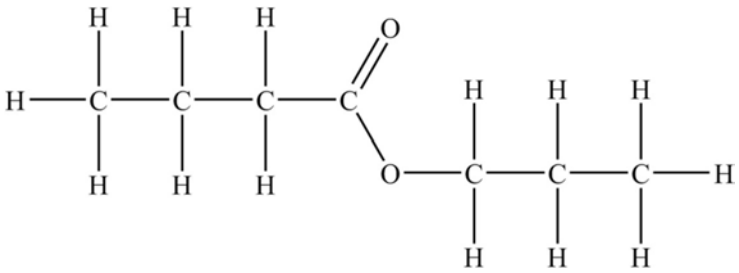
B *Z*-But-2-ene

C Methylpropene

D Propene

Question 17

The displayed formula of an organic compound is shown below.



What is the systematic name of this organic compound? **[1]**

A Propyl propanoate

B Propyl butanoate

C Butyl propanoate

D Butyl butanoate

Question 18

How many stereoisomers are there of $CH_3CH=CHCH(OH)CH_2CH=CH_2$? **[1]**

A 2

B 4

C 6

D 8

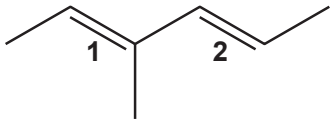
Question 19

CN^- ions react with haloalkanes and with carbonyl compounds.

Which row gives the correct mechanisms for the reactions? **[1]**

	Reaction of CN^- with haloalkanes	Reaction of CN^- with carbonyl compounds
A	Electrophilic substitution	Electrophilic addition
B	Electrophilic substitution	Nucleophilic addition
C	Nucleophilic substitution	Electrophilic addition
D	Nucleophilic substitution	Nucleophilic addition

The molecule below has two double bonds, labelled **1** and **2**.



The arrangement around each double bond can be identified as *E* or *Z*.

Which row in the table is correct for double bond **1** and double bond **2**? **[1]**

	Double bond 1	**Double bond 2**
A	*E*	*Z*
B	*Z*	*E*
C	*E*	*E*
D	*Z*	*Z*

Question 21

The breakdown of ozone is catalysed by NO radicals.

Which equation is a propagation step in the mechanism for this process? **[1]**

A $NO + O_2 \rightarrow N + O_3$

B $NO + O_2 \rightarrow NO_2 + O$

C $N + O_3 \rightarrow NO + O_2$

D $NO_2 + O \rightarrow NO + O_2$

A reaction sequence is shown below:

Step 1 $CH_3CH=CHCH_3 + HBr \rightarrow CH_3CH_2CHBrCH_3$

Step 2 $CH_3CH_2CHBrCH_3 + NaOH \rightarrow CH_3CH_2CH(OH)CH_3 + NaBr$

Which type of reaction mechanism is involved in each step?

[1]

	Step 1	Step 2
A	electrophilic addition	electrophilic substitution
B	electrophilic addition	nucleophilic substitution
C	nucleophilic addition	electrophilic substitution
D	nucleophilic addition	nucleophilic substitution