Chemistry · Organic Chemistry

Alkanes

thanawiya-archive.com

60	3	21
questions	sets	pages

Contents

Multiple choice questions (41 questions) — Questions · p. 2 — Answers · p. 14

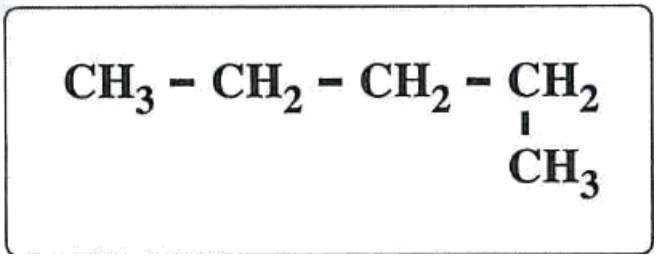
Essay questions (13 questions) — Questions · p. 10 — Answers · p. 18

Past exam questions (6 questions) — Questions · p. 12 — Answers · p. 20

Click a question number to jump to its answer, and an answer number to go back to the question.

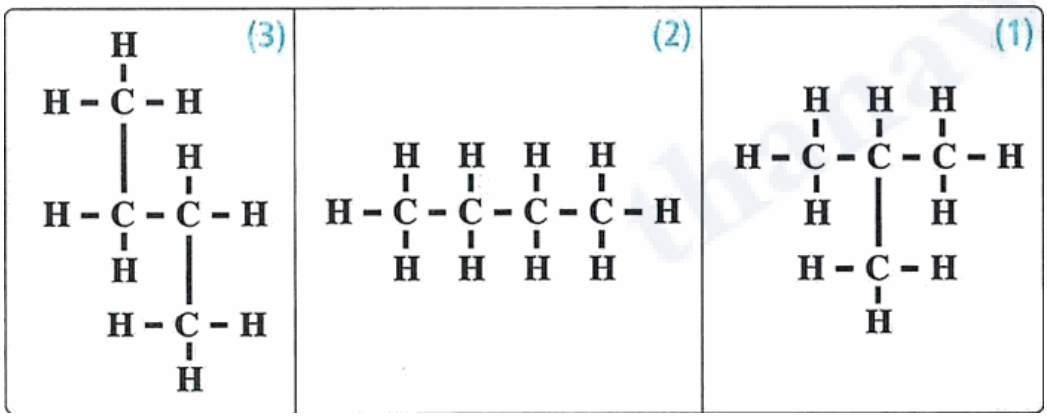
Multiple choice questions — 41 questions

1 What is the IUPAC name of the opposite compound?



(A) 1-methylbutane.
(B) 1,3-methylpropane.
(C) 1,3-dimethylpropane.
(D) normal pentane.

2 From the opposite structural formulas:
Which of the following represents normal butane?



(A) (2) only.
(B) (3) only.
(C) (1) , (2).
(D) (2) , (3).

3 Any two successive members of the alkane series .....

(A) differ in the general formula.
(B) differ in the molar mass.
(C) have the same density.
(D) have the same chemical formula.

4 What is the molecular formula of the alkane whose molar mass is greater than the molar mass of another compound in the same series by 56?
[C = 12 , H = 1]

(A) C_4H_{10}
(B) C_5H_{10}
(C) C_6H_{14}
(D) C_6H_{12}

5 The members of one homologous series have the same .....

(A) chemical formula.
(B) general formula.
(C) physical properties.
(D) structural formula.

6 The members of the alkane series have all of the following in common, except .....

(A) that they are isomers of each other.
(B) that they have similar chemical properties.
(C) that they follow a general molecular formula.
(D) that the difference in molar mass between any two successive compounds is 14

7 Isomerism in alkanes starts to appear with the compound .....

(A) methane. (B) ethane. (C) propane. (D) butane.

8 Butane differs from methylpropane in .....

(A) the homologous series.
(B) the general formula.
(C) the molecular formula.
(D) the structural formula.

9 What is the general formula of alkyl halides?

(A) $C_nH_{2n+1}X$ (B) $C_nH_{2n+2}X$ (C) $C_nH_{n+1}X$ (D) $C_nH_{2n}X$

10 Which of the following is the IUPAC name of the compound that contains (4) methyl groups?

(A) normal hexane.
(B) 2,3-dimethylbutane.
(C) 2-methylpentane.
(D) tetramethylbutane.

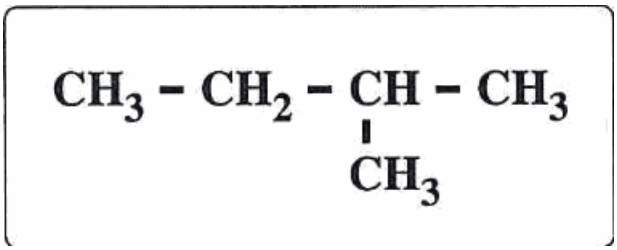
11 What is the number of methyl groups in the branched alkane whose molar mass is (58 g/mol)? [C = 12 , H = 1]

(A) 1 (B) 2 (C) 3 (D) 4

12 What is the number of methylene groups in the compound 3-ethylpentane?

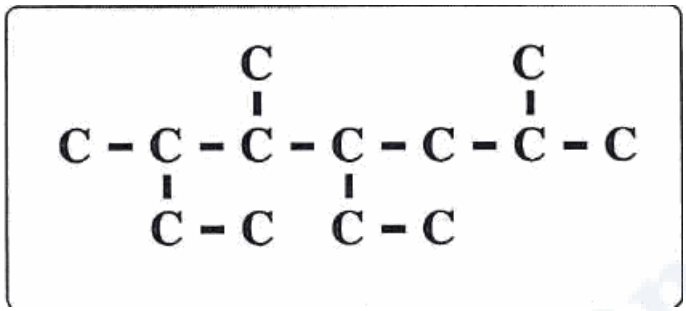
(A) 2 (B) 3 (C) 4 (D) 5

13 What is the IUPAC name of the opposite compound?



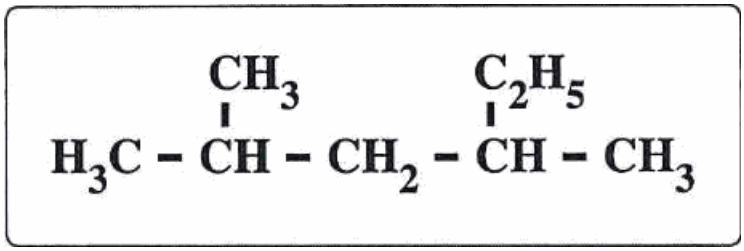
(A) pentane. (B) 3-methylbutane. (C) 2-methylbutane. (D) butane.

14 The opposite figure represents the carbon skeleton of a hydrocarbon.
What is the IUPAC name of this compound?



(A) 2,4-diethyl-3,6-dimethylheptane.
(B) 2,5-dimethyl-4,6-diethylheptane.
(C) 5-ethyl-3,4,7-trimethyloctane.
(D) 4-ethyl-2,5,6-trimethyloctane.

15 What is the IUPAC name of the opposite compound?



(A) 2,4-dimethylhexane.
(B) 3,5-dimethylhexane.
(C) 2-methyl-4-ethylpentane.
(D) 2-ethyl-4-methylpentane.

16 What is the IUPAC name of the opposite compound?
$CH_3(CH_2)_2CH(CH_3)CH(CH_3)_2$

(A) 2,3-dimethyloctane.
(B) 2,3-dimethylhexane.
(C) 4,5-dimethyloctane.
(D) 4,5-dimethylhexane.

17 The compound 2,2,3-trimethylhexane is represented by the chemical formula .....

(A) $CH_3C(CH_3)_2CH_2CH_2CH(CH_3)_2$
(B) $CH_3C(CH_3)_2CH_2CH(CH_3)CH_2CH_3$
(C) $CH_3C(CH_3)_2CH(CH_3)CH_2CH_2CH_3$
(D) $CH_3C(CH_3)_2CH_2C(CH_3)_2CH_3$

18 From the opposite table:

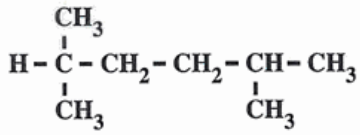
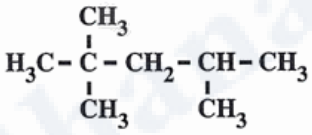
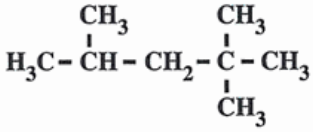
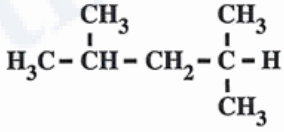
(1) 2-methylbutane
(2) normal octane
(3) 2,2,3-trimethylbutane
(4) 2,2-dimethylpropane

Which two compounds have the same molar mass?

(A) (1) , (2).
(B) (1) , (4).
(C) (2) , (3).
(D) (3) , (4).

19 Here are four structural formulas:

Which two formulas are named 2,2,4-trimethylpentane?

(1) 	(2) 
(3) 	(4) 

(A) (1) , (3).
(B) (1) , (4).
(C) (2) , (3).
(D) (2) , (4).

20 Which of the following is the IUPAC name of the compound that contains no methylene groups?

(A) normal hexane.
(B) 2,3-dimethylbutane.
(C) 2-methylpentane.
(D) 2,2-dimethylbutane.

21 An alkane contains 5 methyl groups and 2 methylene groups.

What is the IUPAC name of this compound?

(A) 2,3,4-trimethylhexane.
(B) 2,2,4-trimethylhexane.
(C) 2,2,3,4-tetramethylpentane.
(D) 2,3,3,4-tetramethylpentane.

22 A paraffin compound has (16) sigma bonds in its molecule.

What is the IUPAC name of an isomer of it that contains no methylene groups?

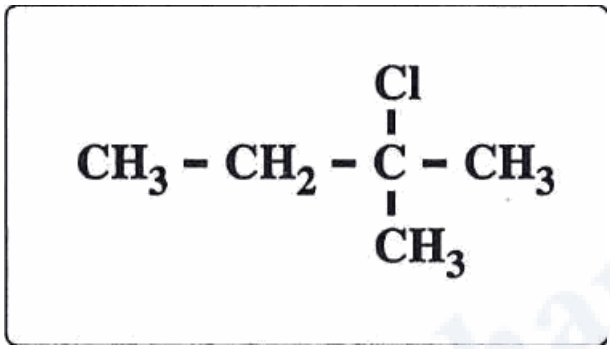
(A) 2-methylpropane.
(B) dimethylpropane.
(C) ethane.
(D) 2,3-dimethylbutane.

23 What is the IUPAC name of the opposite compound?

$CH_3–CH_2–CH_2–CH_2–CH_2Cl$

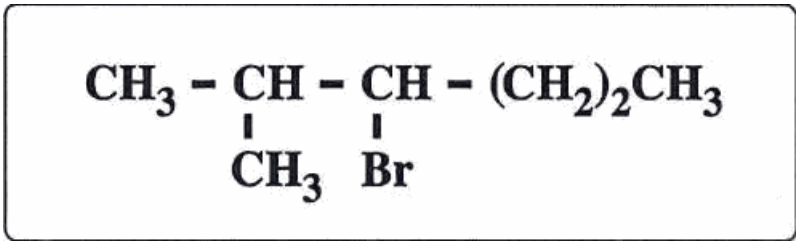
(A) pentyl chloride.
(B) hexane.
(C) 5-chloropentane.
(D) 1-chloropentane.

24 What is the IUPAC name of the opposite compound?



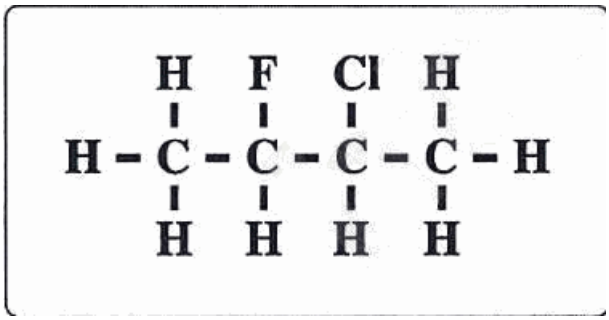
(A) 2-methyl-2-chlorobutane.
(B) 2-chloro-2-methylbutane.
(C) 3-methyl-3-chlorobutane.
(D) 3-chloro-3-methylbutane.

25 What is the IUPAC name of the opposite compound?



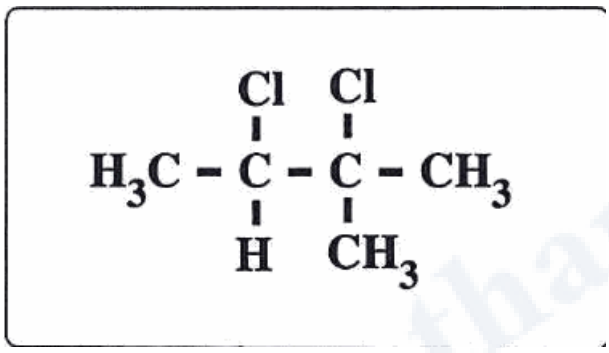
(A) 3-bromo-2-methylpentane.
(B) 2-methyl-3-bromopentane.
(C) 3-bromo-2-methylhexane.
(D) 2-methyl-3-bromohexane.

26 What is the IUPAC name of the opposite compound?



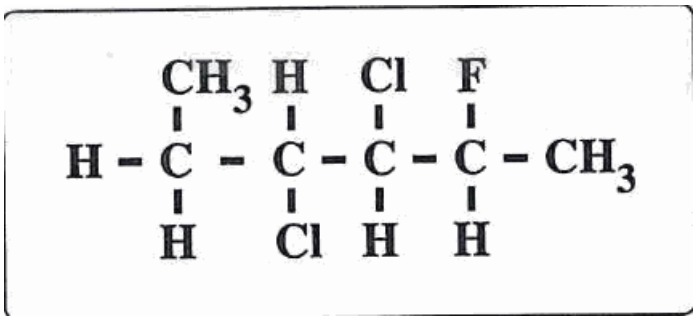
(A) 2-chloro-2-fluorobutane.
(B) 2-fluoro-3-chlorobutane.
(C) 3-fluoro-2-chlorobutane.
(D) 2-chloro-3-fluorobutane.

27 What is the IUPAC name of the opposite compound?



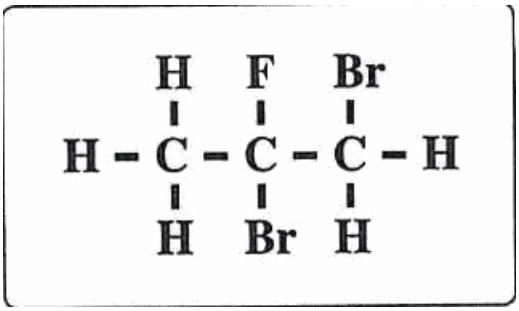
(A) 1,2-dichloro-1,2-dimethylpropane.
(B) 2,3-dichloro-2,3-dimethylpropane.
(C) 2,3-dichloro-2-methylbutane.
(D) 2,3-dichloro-3-methylbutane.

28 What is the IUPAC name of the opposite compound?



(A) 3,4-dichloro-2-fluorohexane.
(B) 3,4-dichloro-5-fluorohexane.
(C) 2-fluoro-3,4-dichlorohexane.
(D) 2,3-dichloro-2-fluoro-1-methylpentane.

29 What is the IUPAC name of the opposite compound?



(A) 2,3-dibromo-2-fluoropropane.
(B) 2-fluoro-2,3-dibromopropane.
(C) 1,2-dibromo-2-fluoropropane.
(D) 2-fluoro-1,2-dibromopropane.

30 What is the structural formula of the compound 5-chloro-2,2-dimethylhexane?

(B) $CH_3-\underset{\underset{H}{|}}{\overset{\overset{Cl}{|}}{C}}-CH_2-CH_2-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-CH_3$

(A) $CH_3-\underset{\underset{Cl}{|}}{\overset{\overset{H}{|}}{C}}-CH_2-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-H$

(D) $CH_3-\underset{\underset{CH_3}{|}}{\overset{\overset{Cl}{|}}{C}}-CH_2-CH_2-\underset{\underset{CH_3}{|}}{\overset{\overset{Cl}{|}}{C}}-CH_3$

(C) $H-\underset{\underset{Cl}{|}}{\overset{\overset{Cl}{|}}{C}}-CH_2-CH_2-CH_2-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-CH_3$

31 What is the number of isomers of the molecular formula $C_3H_6Cl_2$?

(A) 2 (B) 3 (C) 4 (D) 5

32 All of the following are correct names according to the IUPAC system, except .....

(A) 3-chloro-2,2-dimethylbutane.
(B) 2,3-dimethylpentane.
(C) 2-chloro-1,1-dimethylpropane.
(D) 2-bromo-2-chlorohexane.

33 Which of the following is the correct IUPAC name of an organic compound?

(A) 2-chloro-3-bromopentane.
(B) 3-bromo-2-chloropentane.
(C) 4-bromo-2-chloropentane.
(D) 2-chloro-4-bromopentane.

34 What is the number of isomers of the chemical formula $C_2H_3F_3$?

(A) 1 (B) 2 (C) 3 (D) 4

35 Isomers of saturated hydrocarbons are formed when .....

(A) the number of carbon atoms is changed.

(B) the number of hydrogen atoms is changed.

(C) branches are formed in the chain of carbon atoms.

(D) double bonds are formed.

---

36 The compound 2,2-dimethylbutane is an isomer of the compound .....

(A) 2-methylbutane.

(B) 2,2-dimethylpentane.

(C) 2-methylpentane.

(D) 2,2-dimethylpropane.

---

37 What is the number of isomers of the molecular formula $C_2H_3Cl_2Br$?

(A) 2 (B) 3 (C) 4 (D) 5

---

38 What is the number of isomers of the molecular formula $C_3H_5Br_3$?

(A) 2 (B) 3 (C) 4 (D) 5

---

39 What is the number of possible isomers when a hydrogen atom in a molecule of 2,2-dimethylbutane is replaced by one chlorine atom (without changing the arrangement of the carbon skeleton)?

(A) 2 (B) 3 (C) 4 (D) 5

---

40 What is the number of isomers of the molecular formula C_6H_{14}?

(A) 4 (B) 5 (C) 6 (D) 7

---

41 A hydrocarbon has the molecular formula C_6H_{14}

What is the number of its isomers that contain 3 methyl groups, and what is the number of methylene groups in each of these isomers?

(A) 2 isomers / 3 methylene groups.

(B) 2 isomers / 2 methylene groups.

(C) 3 isomers / 2 methylene groups.

(D) 3 isomers / 3 methylene groups.

Essay questions — 13 questions

1 The compound C_7H_{16} belongs to one of the homologous series:

(1) What is the molecular formula of the first member of this series?

(2) What is the type of bonds between the atoms of this compound?

2 Draw the possible isomers of the molecular formula C_4H_9Cl

3 Explain: the compound $CH_3CHBrCH_2CH(CH_3)CH_3$ is named 2-bromo-4-methylpentane, not 2-methyl-4-bromopentane.

4 What is the name and the molecular formula of the alkane - unbranched - of which the compound 3-ethyl-2-methylpentane is one of the isomers?

5 A saturated, non-cyclic aliphatic hydrocarbon is made of 14 atoms:

(1) What is the number of carbon atoms and hydrogen atoms in it?

(2) What are its possible structural formulas? Name each of them.

6 The molecular formula C_5H_{12} represents three isomers.

Draw the structural formula of each of them, and name them according to the IUPAC system.

7 Among the isomers of hexane are two compounds whose longest continuous chain is made of 4 carbon atoms.

Draw the structural formula of these two isomers, and name them according to the IUPAC system.

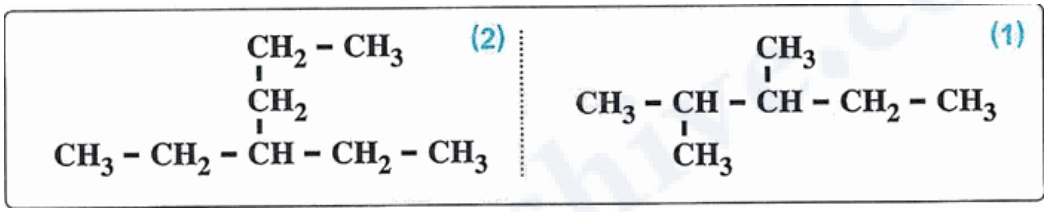
8 Three alkanes differ in their number of isomers:

Alkane (X): 35 isomers. Alkane (Y): 18 isomers. Alkane (Z): 75 isomers.

Choose for each of these alkanes its suitable name from the following, and explain.

Octane. Decane. Nonane.

9 Write the IUPAC name of each of the following two compounds:



10 Write the IUPAC name of each of the following two compounds, in which each point of the skeleton represents a carbon atom:



11 Two alkane isomers have a molar mass of 58 g/mol. Draw the structural formula of each of them, and write the IUPAC name of each.

[C = 12 , H = 1]

12 Draw the structural formula and write the molecular formula of each of:

(1) 3-chloro-2-methylpentane.

(2) an alkane made of 5 carbon atoms that has no methylene groups.

13 Draw the structural formula of each of the following two compounds, then write the correct name of each according to the IUPAC system:

(1) 4-bromobutane.

(2) 3-methylbutane.

Past exam questions — 6 questions

1 An alkane has the molecular formula C_6H_{14} and contains four methyl groups and no methylene groups. (Sample exam 2026)

Which of the following is the IUPAC name of this compound?

(A) 2,2-dimethylbutane.
(B) 3,3-dimethylbutane.
(C) 2,3-dimethylbutane.
(D) 1,4-dimethylbutane.

---

2 From the names of the following compounds: (2nd session 2024)

(A): 2-ethyl-3-methylbutane.

(B): 3,4,4,5-tetramethyloctane.

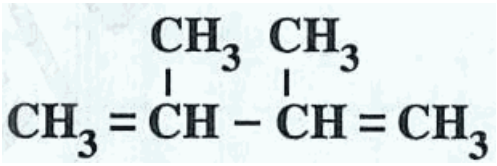
Which of the following statements is correct?

(A) Name (A) is correct, (B) is wrong.
(B) Name (A) is wrong, (B) is correct.
(C) Name (A) is wrong, (B) is wrong.
(D) Name (A) is correct, (B) is correct.

---

3 In the formula: (Trial exam / June 2021)

After rewriting its correct structural formula without changing the molecular formula, it represents a(n) ..... compound.



(A) open-chain aliphatic
(B) unsaturated
(C) alkene
(D) branched alkene

---

4 One of the following compounds has only three isomers ..... (Trial exam / May 2021)

(A) propane.
(B) pentane.
(C) hexane.
(D) butane.

---

5 The compounds that can be similar in physical state and chemical properties are ..... (2nd session 2021)

(A) $C_{18}H_{38}$, C_8H_{18}
(B) $C_{18}H_{38}$, $C_{20}H_{42}$
(C) C_8H_{16} , C_3H_4
(D) $C_{16}H_{32}$, C_3H_6

---

6 The opposite compound: $(CH_3)_2C(C_6H_5)CH_2CH(CH_3)_2$ (1st session 2024)

Which of the following choices is the name of the compound according to the IUPAC system?

(A) 2,4-dimethyl-4-phenylpentane.

(B) 1,1,3,3-tetramethyl-1-phenylpropane.

(C) 2,4-dimethyl-2-phenylpentane.

(D) 2,4,4-trimethyldecane.

Answer key and solutions

Multiple choice questions

1 D	2 D	3 B	4 C	5 B	6 A	7 D	8 D	9 A	10 B
11 C	12 B	13 C	14 D	15 A	16 B	17 C	18 B	19 C	20 B
21 B	22 B	23 D	24 B	25 C	26 D	27 C	28 A	29 C	30 B
31 C	32 C	33 B	34 B	35 C	36 C	37 B	38 D	39 B	40 B
41 B									

1 **Answer (D)**

The longest continuous chain has 5 carbon atoms and there are no branches.

So it is normal pentane.

2 **Answer (D)**

(1) The longest chain has 3 carbon atoms with a methyl group on it: 2-methylpropane.

(2) and (3) are a continuous chain of 4 carbon atoms ((3) is drawn bent): normal butane.

3 **Answer (B)**

Two successive members differ by a CH_2 group, so they differ in molar mass by 14

4 **Answer (C)**

$56 = 4 \times 14$, so the difference is 4 CH_2 groups

The smaller compound is C_2H_6 and the larger is C_6H_{14} (an alkane C_nH_{2n+2}).

5 **Answer (B)**

The members of a homologous series share one general molecular formula.

6 **Answer (A)**

Each alkane differs from the others in its molecular formula, so they are not isomers of each other.

7 **Answer (D)**

Butane C_4H_{10} is the first alkane that has two isomers (normal butane and 2-methylpropane).

8 **Answer (D)**

Butane and methylpropane have the same molecular formula C_4H_{10} and differ in the structural formula.

9 **Answer (A)**

A hydrogen atom of the alkane C_nH_{2n+2} is replaced by a halogen atom X: $C_nH_{2n+1}X$

10 **Answer (B)**

2,3-dimethylbutane: $CH_3–CH(CH_3)–CH(CH_3)–CH_3$

It has 4 methyl groups.

11 **Answer (C)**

$14n + 2 = 58$, $n = 4$: C_4H_{10}

The branched one is 2-methylpropane $CH(CH_3)_3$, which has 3 methyl groups.

12 **Answer (B)**

3-ethylpentane: $CH_3–CH_2–CH(C_2H_5)–CH_2–CH_3$

CH_2 groups: two in the chain and one in the ethyl group = 3

13 **Answer (C)**

The longest chain has 4 carbon atoms and the methyl group is on carbon atom number 2: 2-methylbutane.

14 **Answer (D)**

The longest chain has 8 carbon atoms (it includes one of the two ethyl branches).

Numbering from the end nearer to the branches: ethyl on 4 and methyl on 2, 5, 6

4-ethyl-2,5,6-trimethyloctane.

15 **Answer (A)**

The longest chain has 6 carbon atoms (it includes the ethyl group).

The methyl groups are on carbon atoms 2 and 4: 2,4-dimethylhexane.

16 **Answer (B)**

$CH_3–CH_2–CH_2–CH(CH_3)–CH(CH_3)–CH_3$

The longest chain has 6 carbon atoms and the methyl groups are on 2 and 3: 2,3-dimethylhexane.

17 **Answer (C)**

Hexane (6 carbon atoms) with two methyl groups on C2 and one methyl group on C3: $CH_3C(CH_3)_2CH(CH_3)CH_2CH_2CH_3$

18 **Answer (B)**

(1) C_5H_{12} , (2) C_8H_{18} , (3) C_7H_{16} , (4) C_5H_{12}

So compounds (1) and (4) have the same molar mass.

19 **Answer (C)**

(1): 2,5-dimethylhexane. (4): 2,4-dimethylpentane.

(2) and (3): $CH_3–C(CH_3)_2–CH_2–CH(CH_3)–CH_3$ = 2,2,4-trimethylpentane.

20 **Answer (B)**

2,3-dimethylbutane $CH_3–CH(CH_3)–CH(CH_3)–CH_3$ has no CH_2 groups

21 **Answer (B)**

2,2,4-trimethylhexane: $CH_3–C(CH_3)_2–CH_2–CH(CH_3)–CH_2–CH_3$

It has 5 CH_3 groups and 2 CH_2 groups

22 **Answer (B)**

The number of sigma bonds in an alkane = 3n + 1 = 16 , n = 5: C_5H_{12}

The isomer with no CH_2 is $C(CH_3)_4$: dimethylpropane (2,2-dimethylpropane).

23 **Answer (D)**

A continuous chain of 5 carbon atoms with chlorine on carbon atom number 1: 1-chloropentane.

24 **Answer (B)**

The longest chain has 4 carbon atoms, and the chlorine and the methyl group are on carbon atom number 2

The names are arranged alphabetically (chloro before methyl): 2-chloro-2-methylbutane.

25 **Answer (C)**

The longest chain has 6 carbon atoms, the methyl group is on 2 and the bromine on 3

3-bromo-2-methylhexane.

26 **Answer (D)**

$CH_3–CHF–CHCl–CH_3$: the two groups are on 2 and 3 from either end.

When equal, the one that comes first alphabetically (chloro) takes the smaller number: 2-chloro-3-fluorobutane.

27 **Answer (C)**

$CH_3–CHCl–CCl(CH_3)–CH_3$: the longest chain has 4 carbon atoms.

2,3-dichloro-2-methylbutane.

28 **Answer (A)**

$CH_3–CH_2–CHCl–CHCl–CHF–CH_3$: hexane, numbered from the end nearer to the fluorine.

3,4-dichloro-2-fluorohexane.

29 **Answer (C)**

$CH_3–CBrF–CH_2Br$: propane with two bromine atoms on 1 and 2 and fluorine on 2

1,2-dibromo-2-fluoropropane.

30 **Answer (B)**

5-chloro-2,2-dimethylhexane: $CH_3–CHCl–CH_2–CH_2–C(CH_3)_2–CH_3$

31 **Answer (C)**

The isomers of $C_3H_6Cl_2$: 1,1-, 1,2-, 1,3- and 2,2-dichloropropane = 4

32 **Answer (C)**

In (C) there is a methyl group on the end carbon atom number 1, so the longest chain is not 3 carbon atoms.

So the name is wrong (the correct one is 2-chloro-3-methylbutane).

33 **Answer (B)**

The names are arranged alphabetically, and numbering starts from the end nearer to the branches.

3-bromo-2-chloropentane is correct, and the correct form of 4-bromo-2-chloropentane is 2-bromo-4-chloropentane.

34 **Answer (B)**

The two isomers of $C_2H_3F_3$: $CF_3–CH_3$ and $CHF_2–CH_2F$

35 **Answer (C)**

Alkane isomers result from branching of the carbon chain while the molecular formula stays the same.

36 **Answer (C)**

2,2-dimethylbutane has the formula C_6H_{14}, and so does 2-methylpentane.

37 **Answer (B)**

$CCl_2Br–CH_3$, $CHCl_2–CH_2Br$, $CHClBr–CH_2Cl$: 3 isomers.

38 **Answer (D)**

Positions of the three bromine atoms: 1,1,1 , 1,1,2 , 1,1,3 , 1,2,2 , 1,2,3: 5 isomers.

39 **Answer (B)**

$(CH_3)_3C–CH_2–CH_3$ has 3 different kinds of hydrogen atoms:
the three CH_3 groups on C2, the CH_2 group, and the end CH_3 group.

40 **Answer (B)**

hexane, 2-methylpentane, 3-methylpentane, 2,2-dimethylbutane, 2,3-dimethylbutane: 5

41 **Answer (B)**

The isomers with 3 methyl groups: 2-methylpentane and 3-methylpentane.
Each of them has 2 methylene groups.

Essay questions

1 **Model answer**

(1) CH_4
(2) Single covalent bonds.

2 **Model answer**

$CH_3–CH_2–CH_2–CH_2Cl$ (1-chlorobutane)
$CH_3–CH_2–CHCl–CH_3$ (2-chlorobutane)
$(CH_3)_2CH–CH_2Cl$ (1-chloro-2-methylpropane)
$(CH_3)_3CCl$ (2-chloro-2-methylpropane)

3 **Model answer**

Because when the sums of the branch position numbers are equal, the branch that comes first alphabetically takes the smaller number.

4 **Model answer**

Name: normal octane, molecular formula: C_8H_{18}

5 **Model answer**

General formula of alkanes C_nH_{2n+2}: $n + 2n + 2 = 14$, $n = 4$

(1) Number of carbon atoms = 4, number of hydrogen atoms = 10

(2) $CH_3–CH_2–CH_2–CH_3$: butane.

$CH_3–CH(CH_3)–CH_3$: 2-methylpropane.

6 **Model answer**

$CH_3–CH_2–CH_2–CH_2–CH_3$: pentane.

$CH_3–CH(CH_3)–CH_2–CH_3$: 2-methylbutane.

$C(CH_3)_4$: 2,2-dimethylpropane.

7 **Model answer**

$CH_3–CH(CH_3)–CH(CH_3)–CH_3$: 2,3-dimethylbutane.

$CH_3–C(CH_3)_2–CH_2–CH_3$: 2,2-dimethylbutane.

8 **Model answer**

(X): nonane C_9H_{20} , (Y): octane C_8H_{18} , (Z): decane $C_{10}H_{22}$

Because the number of isomers increases as the number of carbon atoms in the alkane increases.

9 **Model answer**

(1): 2,3-dimethylpentane.

(2): 3-ethylhexane.

10 **Model answer**

(1) 2,2-dimethylpropane.

(2) 3-methylpentane.

11 **Model answer**

General formula of alkanes C_nH_{2n+2}: $12n + 2n + 2 = 58$, $n = 4$

Molecular formula: C_4H_{10}

$CH_3–CH_2–CH_2–CH_3$: butane.

$CH_3–CH(CH_3)–CH_3$: 2-methylpropane.

12 **Model answer**

(1) $CH_3–CH(CH_3)–CHCl–CH_2–CH_3$, molecular formula $C_6H_{13}Cl$

(2) $C(CH_3)_4$, molecular formula C_5H_{12}

13 **Model answer**

(1) $CH_3–CH_2–CH_2–CH_2Br$: 1-bromobutane.

(2) $CH_3–CH(CH_3)–CH_2–CH_3$: 2-methylbutane.

Past exam questions

1	2	3	4	5	6
C	B	A	B	B	C

1 **Answer (C)**

It has no CH_2, so every carbon atom is either CH_3 or CH.

$CH_3–CH(CH_3)–CH(CH_3)–CH_3$: four methyl groups.

Name: 2,3-dimethylbutane.

2 **Answer (B)**

The correct name of (A) is 2,3-dimethylpentane, so the name is wrong.

(B) The numbering 3,4,4,5 is lower than 4,5,5,6, so the name is correct.

3 **Answer (A)**

The molecular formula is C_6H_{14} (an alkane), and the correct formula is: $CH_3–CH(CH_3)–CH(CH_3)–CH_3$

So it is an open-chain aliphatic (saturated) compound.

4 **Answer (B)**

Pentane C_5H_{12} has three isomers: normal pentane, 2-methylbutane, 2,2-dimethylpropane.

5 **Answer (B)**

$C_{18}H_{38}$ and $C_{20}H_{42}$ are two alkanes (same chemical properties) and both are solids (same physical state).

C_8H_{18} is a liquid, and choices (C) and (D) are from different series.

6 **Answer (C)**

Longest chain: $CH_3–C(CH_3)(C_6H_5)–CH_2–CH(CH_3)–CH_3$

Name: 2,4-dimethyl-2-phenylpentane.