

STRUCTURAL ISOMERS – TOPIC TEST 1

QUESTION 1

Structural isomers may come from different families of organic compound. True or false?

Solution

QUESTION 2

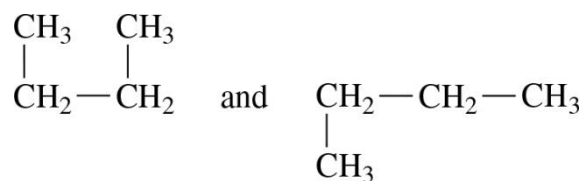
Which of the following compounds has the greatest number of isomers?

- A Ethane
- B Propane
- C Butane
- D Hexane

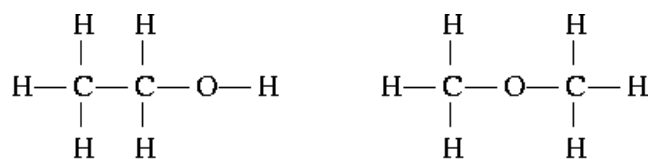
QUESTION 3

Identify each pair of formulas as structural isomers or the same molecule.

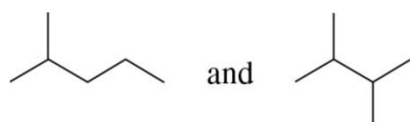
(a)



(b)



(c)



QUESTION 4

Which compounds are structural isomers?

- A 1-propanol and 2-propanol
- B methanoic acid and ethanoic acid
- C methanol and methanal
- D ethane and ethanol

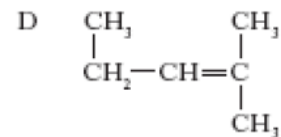
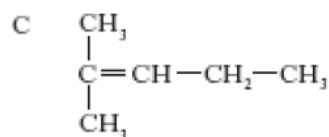
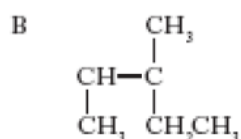
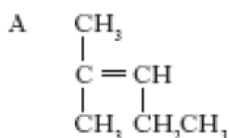
QUESTION 5

Which of the following hydrocarbons does **not** have isomers?

- A C_6H_{14}
- B C_5H_{10}
- C C_4H_8
- D C_3H_8

QUESTION 6

Which of the following hydrocarbons is a structural isomer of 2-methylpent-2-ene? (One or more answers).

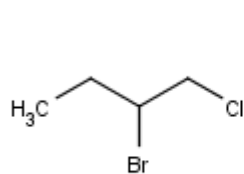
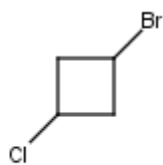
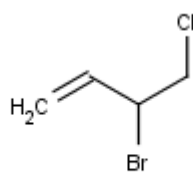
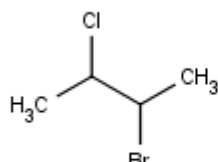
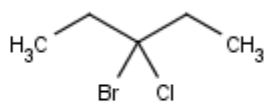
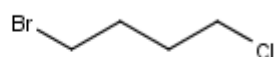
**QUESTION 7**

Give the structural formulae of the isomers of the compound with molecular formula C_3H_6O .

Solution

QUESTION 8

Choose the structural isomers that have the formula C_4H_8BrCl .

**I****II****III****IV****V****VI****Solution**

SOLUTIONS

QUESTION 1 True

QUESTION 2 Answer is D

QUESTION 3

- (a) When we add up the number of C atoms and H atoms, they give the same molecular formula C_4H_{10} . The condensed structural formula on the left has a chain of four C atoms. Even though the $-CH_3$ ends are drawn up, they are part of the four-carbon chain. The condensed structural formula on the right also has a four-carbon chain even though one $-CH_3$ end is drawn down. Thus both condensed structural formulas represent the same molecule and are **not structural isomers**.
- (b) Structural isomers
- (c) When we add up the number of C atoms and H atoms, they give the same molecular formula C_6H_{14} . The line-angle structural formula on the left has a five-carbon chain with a $-CH_3$ substituent on the second carbon of the chain. The line-angle structural formula on the right has a four-carbon chain with two $-CH_3$ substituents, one bonded to the second carbon and one bonded to the third carbon. Therefore, there is a different order of bonding of atoms, which represents **structural isomers**.

QUESTION 4 Answer is A

QUESTION 5 Answer is D

QUESTION 6 Answer is A and D

The molecular formula of 2-methylpent-2ene is C_6H_{12} . The answer is therefore the structure with 5 carbon atoms, 12 hydrogen atoms and a double bond between two carbon atoms.

QUESTION 7



QUESTION 8

Structures I, IV and VI are structural isomers of C_4H_8BrCl .