


**Name:****Score:** 0 / 20 points (0%)

## Chapter 8 Review Quiz

### Multiple Choice

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

 1. How many structural isomers are there for  $C_4H_{10}$ ?

- a. 1
- b. 2
- c. 3
- d. 4


**ANSWER:** B

Isomers must have completely different structural formula from each other.

**POINTS:** 0 / 1

**FEEDBACK:**

**REF:** 253

 2. When naming organic compounds:

- a. only the longest chain is included.
- b. the parent chain must be in a straight line in the diagram.
- c. the substituent groups are listed in numerical order.
- d. the substituent groups are listed in alphabetical order.


**ANSWER:** D

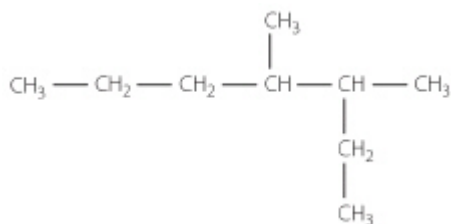
Any side chains (substituent groups) are arranged in alphabetical order not numerical order. The longest chain can be 'bent'.

**POINTS:** 0 / 1

**FEEDBACK:**

**REF:** 243

 3. What is the correct name for the following compound?



- a. 3,4-dimethylheptane
- b. 4-methyl-5-ethylhexane
- c. 3-methyl-4-propylpentane
- d. 4,5-dimethylheptane


**ANSWER:** A

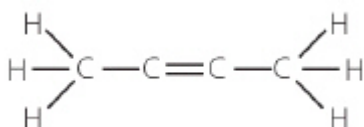
The longest chain has 7 carbons so must be hept- as a prefix.

**POINTS:** 0 / 1

**FEEDBACK:**

**REF:** 243

 4. What is the correct name for the following alkyne?



- a. Butyne
- b. 1-butyne
- c. 2-butyne
- d. 1-methyl-1-propyne

**ANSWER:** C

The position of the triple bond is identified by a number. The triple bond is on the 2nd carbon.

**POINTS:** 0 / 1

**FEEDBACK:**

**REF:** 249



5. Which compound has the highest boiling point?

- a. ethane
- b. butane
- c. pentane
- d. 2-methylbutane

**ANSWER:** C

Larger molecules have higher boiling points due to increased dispersion forces. Molecules with side chains form less dispersion forces than straight chain molecules.

**POINTS:** 0 / 1

**FEEDBACK:**

**REF:** 256



6. The main intermolecular force of attraction between hydrocarbons is:

- a. covalent bonds.
- b. hydrogen bonds.
- c. dipole–dipole forces.
- d. dispersion forces.

**ANSWER:** D

Hydrocarbons are non-polar so only form dispersion forces between molecules.

**POINTS:** 0 / 1

**FEEDBACK:**

**REF:** 256



7. Alkenes are:

- a. saturated, because they do not have the maximum number of hydrogen atoms.
- b. unsaturated, because they do not have the maximum number of hydrogen atoms.
- c. unsaturated, because they have the maximum number of hydrogen atoms.
- d. aromatic compounds.

**ANSWER:** B

Alkenes have double bonds so are unsaturated hydrocarbons.

**POINTS:** 0 / 1

**FEEDBACK:**

**REF:** 246



8. Compounds containing one or more benzene rings are called:


- a. alkanes.
- b. alicyclic compounds.
- c. aliphatic compounds.
- d. aromatic compounds.

**ANSWER:** D

All molecules containing the benzene molecule are referred to as 'aromatic'.

**POINTS:** 0 / 1


**FEEDBACK:****REF:** 254

-  — 9. When a carbon atom has four single bonds, the geometrical arrangement of atoms around it is described as:
- trigonal pyramid.
  - tetrahedral.
  - planar.
  - linear.

**ANSWER:** B

Four single bonds are tetrahedral.


**POINTS:** 0 / 1**FEEDBACK:****REF:** 240

-  — 10. Which of the following statements is incorrect about the molecular formula of a hydrocarbon?
- It does not give information on the structure of the molecule.
  - It can be true for multiple structures.
  - It is the simplest ratio of atoms present in the molecule.
  - It only includes carbon and hydrogen atoms.


**ANSWER:** C

Molecular formulas show the number of all atoms present but may give rise to different structures.

**POINTS:** 0 / 1**FEEDBACK:****REF:** 241

-  — 11. What is the correct formula for octane?
- $C_8H_{18}$
  - $C_8H_{16}$
  - $C_8H_{14}$
  - $C_8H_{20}$


**ANSWER:** AGeneral formula for alkanes is  $C_nH_{2n+2}$ , so with 8 carbons there are 18 hydrogen atoms.**POINTS:** 0 / 1**FEEDBACK:****REF:** 242

-  — 12. Which of the following is an isomer of 2,2-dimethylheptane?
- 2,2,3-trimethylpentane
  - 2,2,3,3-tetramethylpentane
  - Octane
  - 2-methyl-3-ethylpentane

**ANSWER:** B

Isomers have the same molecular formula (number of atoms) but different structures.

**POINTS:** 0 / 1**FEEDBACK:****REF:** 3253

-  — 13. A haloalkane is best described as:
- an unsaturated compound with a halogen atom substituted for a hydrogen atom.
  - a saturated compound with a halogen atom substituted for a carbon atom.

- c. a saturated compound with a halogen atom substituted for a hydrogen atom.
- d. an unsaturated compound with a halogen atom substituted for a carbon atom.


**ANSWER:** C

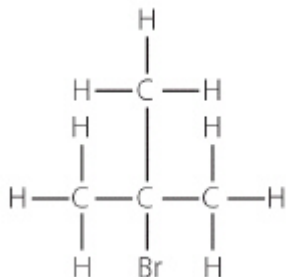
Alkanes are saturated (no double or triple bonds) and have a halogen that replaces one of the hydrogen atoms.

**POINTS:** 0 / 1

**FEEDBACK:**

**REF:** 250

 14. What is the correct name for the following haloalkane?



- a. 2-bromobutane
- b. 2-bromo-methylpropane
- c. 2-bromo-2,2-dimethylethane
- d. 2-bromo-2-methylpropane


**ANSWER:** D

The longest chain has three carbons so must be a propane; bromine atom is on the second carbon.

**POINTS:** 0 / 1

**FEEDBACK:**

**REF:** 250

 15. Which of the following is correct about structural isomers?

- a. They have different molecular formulas.
- b. They must have any double or triple bonds in the same position.
- c. They can be either positional or chain isomers.
- d. They must have the same length main chain.


**ANSWER:** C

Structural isomers have the same molecular formula but have either a functional group in a different place, or a different arrangement of the carbon chain structure.

**POINTS:** 0 / 1

**FEEDBACK:**

**REF:** 253

 16. An organic compound has molecular formula  $C_6H_{13}Br$ . Which of the following is one possible structure of this compound?

- a. 2-bromo-pentane
- b. 3-bromo-heptane
- c. 3-bromo-3-methylhexane
- d. 3-bromo-3-methylpentane


**ANSWER:** D

Only 3-bromo-3-methyl has 6 carbons so fits the molecular formula.

**POINTS:** 0 / 1

**FEEDBACK:**

**REF:** 250

-  — 17. Which of the following statements about benzene is incorrect?
- It contains a ring of delocalised electrons.
  - It is very reactive and unstable.
  - It has formula  $C_6H_6$ .
  - It is very stable and hard to chemically react.


**ANSWER:** B

Benzene is not very reactive and requires special conditions like heat and catalysts to encourage reactions to occur.

**POINTS:** 0 / 1

**FEEDBACK:**

**REF:** 254

-  — 18. Pentane has a higher boiling point than ethane because it forms:
- a stronger type of secondary force between molecules.
  - the same number of dispersion forces between molecules, but the individual dispersion forces are stronger.
  - stronger overall dispersion forces due to an increased number of electrons in the molecule.
  - stronger overall dispersion forces due to an increased number of hydrogen atoms in the molecule.


**ANSWER:** C

A larger molecule contains more electrons as it has more atoms so the number of temporary dipoles that can form across the molecule is larger. Therefore, the overall dispersion forces are stronger.

**POINTS:** 0 / 1

**FEEDBACK:**

**REF:** 256

-  — 19. Alkanes have various uses related to their molecule size and state. Which of the following is an incorrect statement?
- Longer chain molecules are used as lubricants and fuel oils.
  - Ethene is used as a feedstock for polymers and other industrially produced chemicals.
  - Hexane is the main component of petrol.
  - Methane is the main component of natural gas.


**ANSWER:** C

Octane is the main component of petrol, not hexane.

**POINTS:** 0 / 1

**FEEDBACK:**

**REF:** 258

-  — 20. The general formulas for alkanes, alkenes and alkynes are:
- alkane:  $C_nH_{2n+2}$  alkene:  $C_nH_{2n}$  alkyne:  $C_nH_{n-2}$
  - alkane:  $C_nH_{2n}$  alkene:  $C_nH_{2n+2}$  alkyne:  $C_nH_{n+4}$
  - alkane:  $C_nH_{2n-2}$  alkene:  $C_nH_{2n}$  alkyne:  $C_nH_{n+2}$
  - alkane:  $C_nH_{2n+2}$  alkene:  $C_nH_{2n}$  alkyne:  $C_nH_{n-4}$

**ANSWER:** A

As you move from alkanes, through alkenes and alkynes, the number of hydrogens per carbon reduces by 2.

**POINTS:** 0 / 1

**FEEDBACK:**

**REF:** 249

