

1. The number of electrons that is/are shared in a **single** hydrogen-carbon bond is/are _____ electrons.

a) One b) two
c) four d) six

2. Acetylene ($\text{C}_2\text{H}_{2(g)}$) is classified as an **unsaturated hydrocarbon**. Choose the TRUE statement about acetylene below.
- a) It easily dissolves in water.
 - b) It is the first member of the alkenes.
 - c) It will undergo a substitution reaction with chlorine.
 - d) It is a member of the alkyne series.

3. Below is a list of organic compounds. The compound that could contain a trigonal planar shape about one of its central atoms is
- | | |
|------------------------------|------------------------------------|
| a) C_4H_{10} | b) C_2H_2 |
| c) CH_3COOH | d) $\text{C}_7\text{H}_5\text{OH}$ |

4. Which of the following is **NOT** a property of alkanes?
- a) They are soluble in water.
 - b) They undergo substitution reactions with halogens.
 - c) The boiling point increases as the number of carbons increase.
 - d) They are non-reactive under ordinary conditions.

5. Propane ($\text{C}_3\text{H}_{8(g)}$) has low solubility in water. This is primarily due to the fact that _____
- a) Propane is a gas.
 - b) Propane is nonpolar and water is polar.
 - c) Both propane and water are nonpolar.
 - d) Propane is polar and water is nonpolar.

- | Number | Compound |
|--------|---------------------------------|
| 1 | Sucrose($C_{12}H_{22}O_{11}$) |
| 2 | Acetylene (C_2H_2) |
| 3 | Methanal (CH_2O) |
| 4 | Benzene (C_6H_6) |
| 5 | Ethanol (C_2H_5OH) |
| 6 | Methanoic Acid ($HCOOH$) |
| 7 | Glucose ($C_6H_{12}O_6$) |

The compound that is the **least stable** at room temperature is _____ while the compound that is the **most stable** at room temperature is _____

- a) 1 and 3 b) 2 and 7
c) 3 and 2 d) 2 and 1

7. The substance listed below that would exist in a gaseous phase at room temperature is _____.

- a) octan-1-ol b) 2, 2, 4-trimethylpentane
c) dec-2- ene d) ethane

8. Aliphatic hydrocarbons have very similar physical properties. Identify the **FALSE statement** below.

- The boiling point increases as the number of carbon atoms per molecule increases
- Aliphatic hydrocarbons can be combusted in the presence of oxygen to release thermal energy.
- Aliphatic hydrocarbons can be obtained from crude oil by fractional distillation.
- Aliphatic hydrocarbons are soluble in solvents such as water, hydrochloric acid and sodium hydroxide solution.

9. The compound that is the most soluble in water is

- a) ethanol b) pentan-1-ol
c) hexan-1-ol d) octan-3-ol

10. The compounds below that will be low in solubility in water will be _____ and _____

- a) ethanol, methanol b) Ethanoic acid, sucrose
c) acetylene, ethene d) methanoic acid, glucose

11. The statement that is **False** for an organic acid is _____

- a) Their general form is RCOOH .
- b) They have a small K_a value
- c) They react with alcohols to form esters.
- d) They have high solubility in water.

12. Choose the compounds below that have the lowest boiling point.

- a) C_4H_{10}
c) C_7H_5COOH
- b) C_8H_{18}
d) CH_3OH

13. The substance listed below that would readily dissolve in water is

- a) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$ b) CH_3OH
c) C_6H_6 d) $\text{CH}_3\text{COOCH}_2\text{CH}_3$

14. Which of the following statements are TRUE for a 0.10 mol/L of Citric acid ($\text{C}_3\text{H}_5(\text{COOH})_3(\text{aq})$)?

1	Polyprotic carboxylic acid
2	Gives Oranges their sour taste.
3	Carbon has oxidation number of -1
4	Turns HOr orange.

- a) 1 and 2 b) 1, 2, and 3
c) 1, 3, and 4 d) 1, 2 and 4

15. From the organic halides listed below, the substance with the highest boiling point is _____

- a) 1,1-dichloroethane b) 1,1-dibromoethane
- c) 1,1-diiodoethane d) 1,1-difluoroethane

16. When students heated both propane ($C_3H_8(g)$) and acetaldehyde ($CH_3CHO(l)$) in the laboratory, they discovered that Propane boils at $-42^\circ C$ and acetaldehyde boils at $20^\circ C$. The difference in boiling points is due to _____

- a) the polar nature of acetaldehyde
- b) stronger intramolecular forces of propane
- c) weaker intramolecular forces of acetaldehyde
- d) the polar nature of propane

17. The descriptions that apply to both chloro cyclobutane and 2-bromopentane are: _____, _____ and _____

a	Saturated	Aromatic	halogenated
b	Unsaturated	Aliphatic	cyclical
c	Alkanes	Halogenated	aliphatic
d	Saturated	Alkynes	cyclical

18. Compounds that will be soluble in water includes _____ and _____

- a) alkenes and alkanes
- b) alcohols and acids
- c) alkynes and alkanes
- d) esters and alkenes

19. Which member of the homologous series below will have the highest boiling point?

- a) ethane
- b) heptane
- c) hexane
- d) pentane

Solutions:

1. B
2. D
3. C
4. A
5. B
6. D
7. D
8. D
9. A
10. C
11. D
12. A
13. B
14. D
15. C
16. A
17. C
18. B
19. B