1. Organic Compounds are most likely to

- contain covalent bonds
- not burn in air
- have high melting points
- be soluble in water

CH₃CH₂CH₂CH₂CH₃ is named

- pentane
- hexane
- propane
- butane

2. This compound is named

- 3-methylpentane
- 4-methylpentane
- 2-methylpentane
- methylpentane
3. This compound is named

- 4,4-dimethylhexane
- 3,3-methylhexane
- 3,3-dimethylhexane
- 4-methylhexane

4. A compound mistakenly named 3,4-dimethylbutane should be named correctly as

- 4-methylpentane
- 2-methylpentane
- 1-methylpentane
- 3-methylpentane

5. The products of the balanced equation for the combustion of propane are

- $2\text{CO}_2 + 4\text{H}_2\text{O}$
- $3\text{CO} + 4\text{H}_2\text{O}$
- $3\text{CO}_2 + 4\text{H}_2\text{O}$
- $3\text{CO}_2 + 8\text{H}_2\text{O}$

6. The names of two structural isomers of $C_5H_{12}$ are

- 2-methylbutane and 2,2-dimethylpropane
- pentane and 2-methylbutane
- 2,2-dimethylpropane and pentane
- any of the above

7. Which of the following pairs represent structural isomers?

- propane and butane
- 2-methylbutane and butane
- 2-methylpropane and propane
- 2-methylpentane and 2,3-dimethylbutane
8. The name of this compound is
- 1-methylcyclohexane
- hexylmethane
- methylcyclohexane
- methylhexane

9. This compound is named
- cyclohexylidimethane
- methylcyclohexane
- 1,3-methylcyclohexane
- 1,3-dimethylcyclohexane

10. Which of the following compounds is soluble in water?
- sodium chloride
- hexane
- cyclopentane
- 2-methylhexane
11. This compound is named
- 1,4-dichlorocyclohexane
- 2,5-dichlorocyclohexane
- p-dichlorobenzene
- dichlorocyclohexane

12. This compound is named
- p-chlorotoluene
- p-chloromethylbenzene
- chloromethylbenzene
- m-chlorotoluene

13. The compound 2,4-dimethylpentane has the molecular formula
- C₈H₁₈
- C₇H₁₆
- C₅H₁₂
- C₆H₁₄
14. Benzene has the molecular formula

- $C_6H_12$
- $C_6H_{10}$
- $C_6H_{14}$
- $C_6H_6$

Haloalkanes, Alkenes, and Alkynes

1. A functional group

- is where chemical reactions occur in an organic molecule
- determine the family name of the compound
- is a specific atom or group of atoms
- All of the above.

2. The functional group in alkenes is

- a carbon-carbon double bond
- a benzene ring
- a carbon-carbon single bond
- a carbon-carbon triple bond
- Any of the above

3. The functional group in a haloalkane is

- a bromine atom
- a chlorine atom
- a fluorine atom
- Any of the above
4. The name of CH₃CH₂CHClCH₃ is

- chlorobutane
- 1-chlorobutane
- 2-chlorobutane
- 3-chlorobutane

5. Name the following compound: CH₃CH=CHCH₂CH₃.

- pentene
- 2-pentene
- 2-pentyne
- 2,3-pentene

6. A 6-carbon ring with a double bond is named

- hexene
- 1-cyclohexene
- cyclohexene
- cyclohexane

7. The compound named 2-butyne has

- a chain of four carbon atoms with a triple bond between C2 and C3
- a chain of four carbon atoms with a double bond between C1 and C2
- a chain of four carbon atoms with a triple bond between C1 and C2
- a chain of four carbon atoms with a double bond between C2 and C3

8. Which of the following alkenes can have cis-trans isomers?

- 1-butene
- 2-butene
- 2-methyl-1-propene
- All of the above
9. The product of the hydrogenation of 2-butene is
- 2-butane
- butane
- 2-butyne
- butene

10. The addition of Br₂ to cyclohexene gives
- o-bromocyclohexane
- bromocyclohexane
- 1-bromocyclohexane
- 1,2-dibromocyclohexane

11. The addition of HCl to 2-methyl-2-butene follows Markovnikov's Rule. The product is
- 2,3-dichloro-2-methylbutane
- 2-chloro-2-methylbutane
- 3-chloro-2-methylbutane
- 2-chlorobutane

12. The addition of H₂ to 3-methylcyclopentene gives the product named
- 3-methylcyclopentane
- methylcyclopentane
cyclopentene
cyclopentane

13. The name of the isomer of 2-butene with the methyl groups on opposite sides of the double bond is
- 2-butene
- cis-2-butene
- trans-2-butene
14. The addition of Cl₂ to 4-methyl-2-pentene gives the product named

- 2,3-dichloro-2-methylpentane
- None of the above
- 3, 4-dichloro-2-methylpentane
- 2, 3- dichloro-4-methylpentane

15. Polyethylene is a compound

- known as a polymer
- made of repeating units called monomers
- made from many molecules of ethene
- all of the above.

Alcohols, Phenols, Ethers, Aldehydes, and Ketones

1. Which of the following is NOT a functional group that contains oxygen?

- ether
- phenol
- alcohol
- thiol

2. The IUPAC name of CH₃CH₂CH₂OH is

- triol
- propanol
- 1-propanol
- propyl alcohol
3. When a hydrogen atom in benzene is replaced by a hydroxyl group -OH, the compound is part of a family is known as

- phenol
- thiol
- ether
- alcohol

4. The compound named 1-butanethiol has the structural formula of

- CH₃SH
- CH₃CH₂CH₂SH
- CH₃CH₂SH
- CH₃CH₂CH₂CH₂SH

5. The compound CH₃-O-CH₂CH₃ is named

- methyl ether
- propane ether
- methyl ethyl ether
- ethyl methyl ether

At high temperature, the dehydration of cyclohexanol in the presence of an acid produces

- hexene
- cyclohexene
- hexane
- cyclohexane

6. Which of the following compounds would produce 2-butene at high temperatures and in the presence of an acid?

- 1-butanol
- cyclobutanol
7. The aldehyde that has a four-carbon chain and a methyl group on carbon 2 has an IUPAC name of
   - 2-methylbutyraldehyde
   - 3-methylbutyraldehyde
   - 2-methylbutanal
   - 3-methylbutanal

8. The compound with the common name diethylketone has the IUPAC name of
   - 2-pentanone
   - 2-butanone
   - ethanone
   - 3-pentanone

9. The alcohol that contains two alkyl groups attached to the carbon bonded to the -OH group is a
   - quaternary alcohol
   - tertiary alcohol
   - primary alcohol
   - secondary alcohol

10. The oxidation of 2-butanol gives
    - butanal
    - butane
    - 2-butanone
    - 2-butene
11. The compound butanal would be produced from the oxidation of

Your answer:
- 2-butanol
- 1-butanol
- butyl ether
- 1-butene

12. The reaction of acetone and one alcohol molecule will give a

- hemiacetal
- ketal
- acetal
- hemiketal

13. When the product of the dehydration of 1-propanol is hydrated again and oxidized, the product would be

- propanal
- propanone
- propane
- propene
1. The IUPAC name of the compound pictured above is
- methanoic acid
- acetic acid
- propanoic acid
- ethanoic acid

2. The common name of ethanoic acid is
- propionic acid
- formic acid
- ethanic acid
- acetic acid

3. The name of the compound pictured above is
- hexanoic acid
- methylpentanoic acid
- 3-methylpentanoic acid
- 2-methylpentanoic acid
4. Benzoic acid is a
- [ ] salt
- [ ] weak base
- [ ] weak acid
- [ ] strong acid

5. The IUPAC name of the product from the reaction of ethanol and butyric acid is
- [ ] butyl ethanoate
- [ ] ethyl butanoate
- [ ] methy pentanoate
- [ ] ethyl butyrate

6. Compounds that provide the fragrance of fruits such as banana, oranges, and pineapples are
- [ ] alcohols
- [ ] amines
- [ ] carboxylic acids
- [ ] esters

7. The IUPAC name of the compound pictured is
- [ ] ethyl propanoate
- [ ] propyl ethanoate
- [ ] propyl acetate

[Image of chemical structure: CH₃CH₂COCH₂CH₃]
8. The reaction of a sodium hydroxide and ethyl ethanoate is called

- saponification
- esterification
- hydration
- acid hydrolysis

9. In water, an amine acts as a

- weak base
- salt
- strong base
- weak acid

10. Which of the following compounds are amines?

- histamine
- epinephrine
- dopamine
- all of the above

11. The hydrolysis products are formed when the following compound undergoes acid hydrolysis.

- ethyl propanoate
- butyl ethanoate
12. When ethyl amine reacts with HCl, the product is

- CH₃CH₂NH₃⁺ Cl⁻
- CH₃NH₂⁺ Cl⁻
- CH₃CH₃ + NH₄Cl
- CH₃CH₂NH₂ + Cl⁻

13. The common name of this compound is

- dimethylamine
- propyl methanamine
- ethylpropylamine
- methylpropylamine

14. The IUPAC name of this compound is

- methylbutanamide
- methylbutylamide
- N-methylbutanamide
- methyl-N-butranamide
15. Nicotine, caffeine, and morphine are examples of physiologically active

- amines
- carboxylic acids
- amides
- ester