Deep Run High School

CHEMISTRY I: 1(A), 5(A), 7(A)

Unit 6 Test

Instructor: **Jennifer Krug**

ID: **7364**

Name: _____ Score: / 100

Instructions:

Question 1 /1

Dipole - dipole interactions occur due to

- ☐ an uneven distribution of valence elctrons.
- ☐ similarities in atomic radius.
- ☐ a small difference in electronegativity.
- ☐ differences in the amount of shielding.

Name: _____

Question 2 /1

Which of the following molecules exhibits a dipole - dipole interaction?

- ☐ CCl_4
- ☐ BF_3
- ☐ CO_2
- ☐ PCl_3

Question 3 /1

Which of the following molecules exhibits a 105° bond angle?

- ☐ CH_2O
- ☐ H_2O
- ☐ C_2H_2
- ☐ CO_2

Name: _____

Question 4 /1

What is the VSEPR shape of a dihydrogen selenide molecule?

- ☐ linear
- ☐ pyramidal
- ☐ bent
- ☐ tetrahedral

Question 5 /1

Atoms with ___ valence electrons typically form a trigonal pyramidal structure.

- ☐ 6
- ☐ 4
- ☐ 5
- ☐ 3

Name: _____

Question 6 /1

What bond angles are present in a phosphorus trichloride molecule?

- ☐ 120°
- ☐ 107°
- ☐ 105°
- ☐ 109.5°

Question 7 /1

According to the electronegativity table below, predict the polarity between a phosphorus atom and an hydrogen atom.

Electronegativity Values of Some Atoms

2.1 H						
1.0 Li	1.5 Be	2.0 B	2.5 C	3.0 N	3.5 O	4.0 F
0.9 Na	1.2 Mg	1.5 Al	1.8 Si	2.1 P	2.5 S	3.0 Cl
0.8 K	1.0 Ca				2.4 Se	2.8 Br

- ☐ nonpolar ionic
- ☐ nonpolar covalent
- ☐ ionic

Name: _____

Question 8 /1

According to the electronegativity chart below, predict the polarity between a carbon atom and an oxygen atom.

Electronegativity Values of Some Atoms

2.1 H						
1.0 Li	1.5 Be	2.0 B	2.5 C	3.0 N	3.5 O	4.0 F
0.9 Na	1.2 Mg	1.5 Al	1.8 Si	2.1 P	2.5 S	3.0 Cl
0.8 K	1.0 Ca				2.4 Se	2.8 Br

- ☐ nonpolar ionic
- ☐ nonpolar covalent
- ☐ polar covalent
- ☐ ionic

Name: _____

Question 9 /1

Which of the following atoms exists as a diatomic molecule?

- ☐ neon
- ☐ helium
- ☐ bromine
- ☐ carbon

Question 10 /1

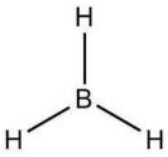
What is the bond angle of a carbon dioxide molecule?

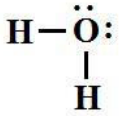
- ☐ 105°
- ☐ 120°
- ☐ 180°
- ☐ 90°

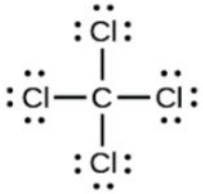
Name: _____

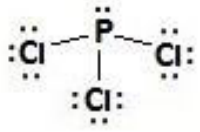
Question 11 /1

Which of the following demonstrates the trigonal planar VSEPR shape?

☐ 

☐ 

☐ 

☐ 

Name: _____

Question 12 /1

Which of the following atoms breaks the octet rule?

- ☐ Boron
- ☐ Arsenic
- ☐ Silicon
- ☐ Selenium

Question 13 /1

Which of the following represents the bond structure of a tetrahedral molecule?

- ☐ four single bonds and no lone pairs
- ☐ three single bonds and one lone pair
- ☐ three single bonds and no lone pairs
- ☐ two single bonds and two lone pairs

Name: _____

Question 14 /1

Which of the following molecules exhibits a tetrahedral structure?

- ☐ CO_3^{-2}
- ☐ CH_3Cl
- ☐ H_2O
- ☐ NH_3

Question 15 /1

Sort the following chemicals from weakest to strongest based on intermolecular forces.

- ☐ **NaF**
- ☐ **BCl_3**
- ☐ **HF**
- ☐ **Cl_2**

Name: _____

Question 16 /1

Which of the following molecules will have the highest surface tension?

- ☐ BF_3
- ☐ HBr
- ☐ CCl_4
- ☐ NH_3

Question 17 /1

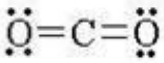
Which of the following molecules has the highest viscosity?

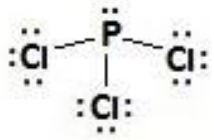
- ☐ HCl
- ☐ N_2
- ☐ PCl_3
- ☐ NH_3

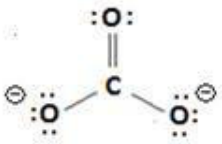
Name: _____

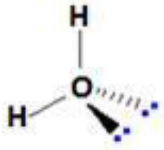
Question 18 /1

Which of the following molecules exhibits the strongest intermolecular forces?

☐ 

☐ 

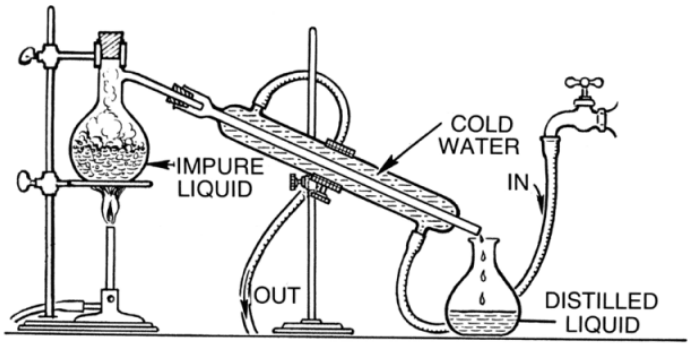
☐ 

☐ 

Name: _____

Question 19 /1

The following apparatus is used to separate liquids based on their _____.



- ☐ densities
- ☐ melting points
- ☐ boiling points
- ☐ molar masses

Name: _____

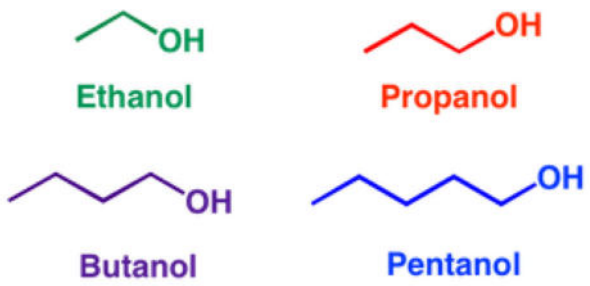
Question 20 /1

All of the following are common pharmaceuticals *EXCEPT*

- [ ] nylon
- [ ] vitamins
- [ ] insulin
- [ ] aspirin

Question 21 /1

Which of the following hydrocarbons will have the highest boiling point?



- [ ] pentanol
- [ ] propanol
- [ ] butanol
- [ ] ethanol

Name: _____

Question 22 /1

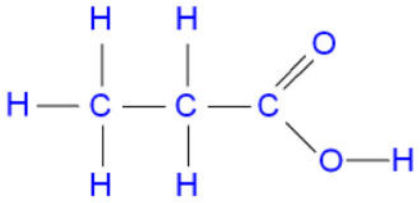
Which of the following is an example of a natural polymer?

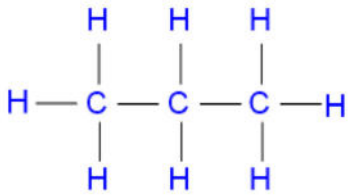
- ☐ plastic
- ☐ nylon
- ☐ protein
- ☐ Kevlar

Name: _____

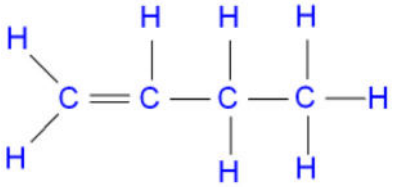
Question 23 /1

Which of the following hydrocarbons is **saturated?**

☐ 

☐ 

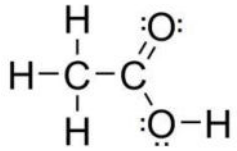
☐

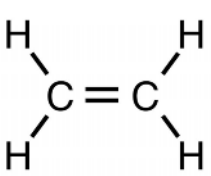
☐ 

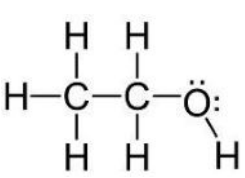
Name: _____

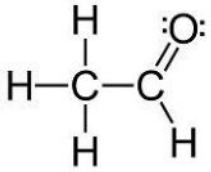
Question 24 /1

Which of the following structures represents a nonpolar molecule?

☐ 

☐ 

☐ 

☐ 

Name: _____

Question 25 /1

Select **all** of the following that belong to the **alkane** group?

- ☐ C_4H_{10}
- ☐ C_3H_8
- ☐ C_2H_4
- ☐ C_2H_2

Question 26 /1

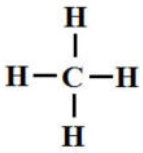
Which of the following is the mathmatical formula used to predict the pattern of an **alkyne**?

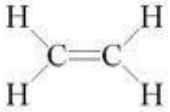
- ☐ $C_n\ H_{2n+2}$
- ☐ $C_n\ H_{2n}$
- ☐ $C_n\ H_{2n-2}$
- ☐ $C_n\ H_n$

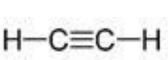
Name: _____

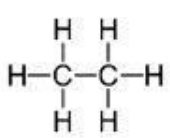
Question 27 /1

Which of the following is the proper molecular structure for ethene?

☐ 

☐ 

☐ 

☐ 

Question 28 /1

Which of the following is held together by ion-ion attraction?

☐ $MgCl_2$

☐ PCl_3

☐ CCl_4

☐ HCl

Name: _____

Question 29 /1

Which of the following compounds would exhibit the highest boiling point?

- ☐ Cl_2
- ☐ H_2O
- ☐ PCl_3
- ☐ NaCl

Question 30 /1

The molecules in a sample of carbon dioxide gas are attracted to each other by _____.

- ☐ London dispersion forces
- ☐ hydrogen bonding forces
- ☐ dipole - dipole forces
- ☐ ion - ion forces

Name: _____

Question 31 /1

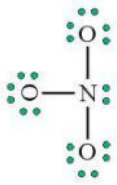
Which of the following molecules would have the lowest boiling point?

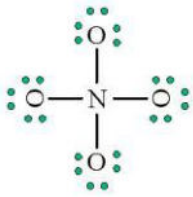
- ☐ CH_4
- ☐ PCl_3
- ☐ H_2O
- ☐ Na_2O

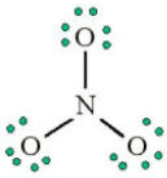
Name: _____

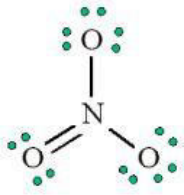
Question 32 /1

Which of the following is the correct Lewis Dot structure for a nitrate ion?

☐ 

☐ 

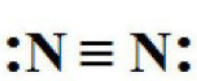
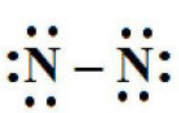
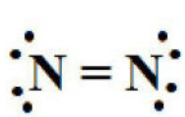
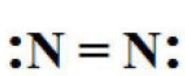
☐ 

☐ 

Name: _____

Question 33 /1

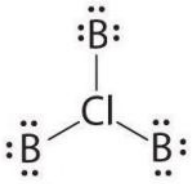
Which of the following is the correct Lewis Dot structure for nitrogen gas?

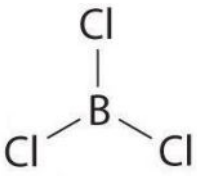
- ☐ 
- ☐ 
- ☐ 
- ☐ 

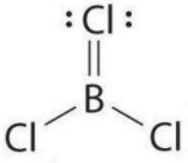
Name: _____

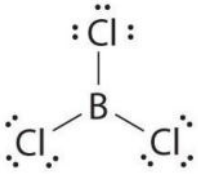
Question 34 /1

Which of the following is the correct Lewis Dot structure for boron trichloride?

☐ 

☐ 

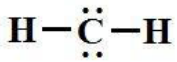
☐ 

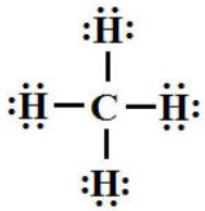
☐ 

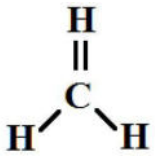
Name: _____

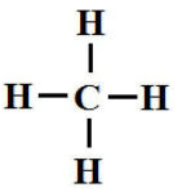
Question 35 /1

Which of the following is the correct Lewis Dot structure for methane?

☐ 

☐ 

☐ 

☐ 

Instructions for grading: Grade each question and tally the score to obtain the total test points. If the factor does not equal 1, multiply the total points by the factor to obtain the student's final score.

Question 1

Dipole - dipole interactions occur due to

☐ an uneven distribution of valence elctrons.

1 possible pts.

Question 2

Which of the following molecules exhibits a dipole - dipole interaction?

☐ PCl_3

1 possible pts.

Question 3

Which of the following molecules exhibits a 105° bond angle?

☐ H_2O

1 possible pts.

Question 4

What is the VSEPR shape of a dihydrogen selenide molecule?

☐ bent

1 possible pts.

Question 5

Atoms with ___ valence electrons typically form a trigonal pyramidal structure.

☐ 5

1 possible pts.

Question 6

What bond angles are present in a phosphorus trichloride molecule?

☐ 107°

1 possible pts.

Question 7

According to the electronegativity table below, predict the polarity between a phosphorus atom and an hydrogen atom.

Electronegativity Values of Some Atoms

2.1 H						
1.0 Li	1.5 Be	2.0 B	2.5 C	3.0 N	3.5 O	4.0 F
0.9 Na	1.2 Mg	1.5 Al	1.8 Si	2.1 P	2.5 S	3.0 Cl
0.8 K	1.0 Ca				2.4 Se	2.8 Br

☐ nonpolar covalent

1 possible pts.

Question 8

According to the electronegativity chart below, predict the polarity between a carbon atom and an oxygen atom.

Electronegativity Values of Some Atoms

2.1 H						
1.0 Li	1.5 Be	2.0 B	2.5 C	3.0 N	3.5 O	4.0 F
0.9 Na	1.2 Mg	1.5 Al	1.8 Si	2.1 P	2.5 S	3.0 Cl
0.8 K	1.0 Ca				2.4 Se	2.8 Br

☐ polar covalent

1 possible pts.

Question 9

Which of the following atoms exists as a diatomic molecule?

☐ bromine

1 possible pts.

Question 10

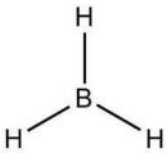
What is the bond angle of a carbon dioxide molecule?

☐ 180°

1 possible pts.

Question 11

Which of the following demonstrates the trigonal planar VSEPR shape?

☐ 

1 possible pts.

Question 12

Which of the following atoms breaks the octet rule?

☐ Boron

1 possible pts.

Question 13

Which of the following represents the bond structure of a tetrahedral molecule?

☐ four single bonds and no lone pairs

1 possible pts.

Question 14

Which of the following molecules exhibits a tetrahedral structure?

☐ CH_3Cl

1 possible pts.

Question 15

Sort the following chemicals from weakest to strongest based on intermolecular forces.

4 NaF

2 BCl_3

3 HF

1 Cl_2

1 possible pts.

Question 16

Which of the following molecules will have the highest surface tension?

☐ NH_3

1 possible pts.

Question 17

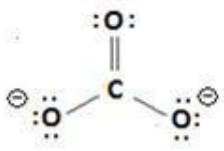
Which of the following molecules has the highest viscosity?

☐ NH_3

1 possible pts.

Question 18

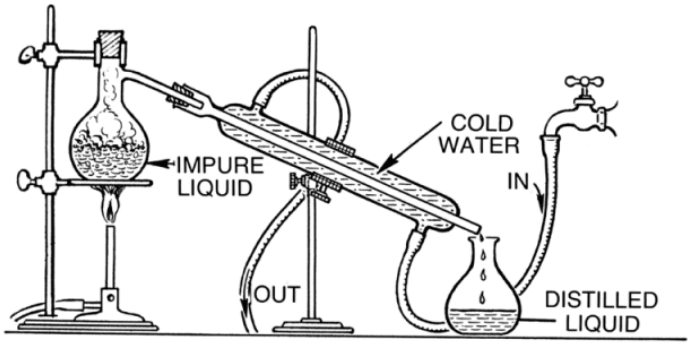
Which of the following molecules exhibits the strongest intermolecular forces?

☐ 

1 possible pts.

Question 19

The following apparatus is used to separate liquids based on their _____.



☐ boiling points

1 possible pts.

Question 20

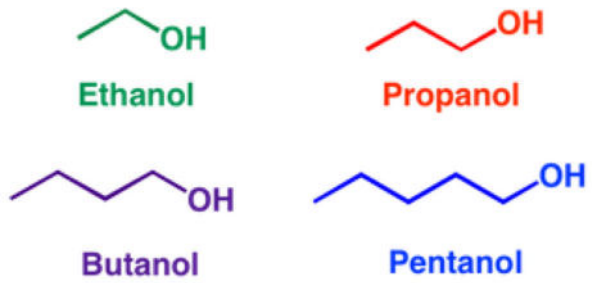
All of the following are common pharmaceuticals *EXCEPT*

☐ nylon

1 possible pts.

Question 21

Which of the following hydrocarbons will have the highest boiling point?



☐ pentanol

1 possible pts.

Question 22

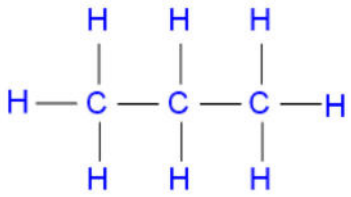
Which of the following is an example of a natural polymer?

☐ protein

1 possible pts.

Question 23

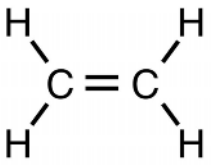
Which of the following hydrocarbons is **saturated?**

☐ 

1 possible pts.

Question 24

Which of the following structures represents a nonpolar molecule?

☐ 

1 possible pts.

Question 25

Select **all** of the following that belong to the **alkane** group?

- ☐ C_4H_{10}
- ☐ C_3H_8

1 possible pts. / partial credit

Question 26

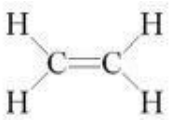
Which of the following is the mathmatical formula used to predict the pattern of an **alkyne**?

- ☐ $C_n H_{2n-2}$

1 possible pts.

Question 27

Which of the following is the proper molecular structure for ethene?

- ☐ 

1 possible pts.

Question 28

Which of the following is held together by ion-ion attraction?

☐ $MgCl_2$

1 possible pts.

Question 29

Which of the following compounds would exhibit the highest boiling point?

☐ NaCl

1 possible pts.

Question 30

The molecules in a sample of carbon dioxide gas are attracted to each other by _____.

☐ London dispersion forces

1 possible pts.

Question 31

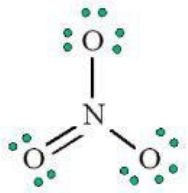
Which of the following molecules would have the lowest boiling point?

☐ CH_4

1 possible pts.

Question 32

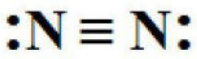
Which of the following is the correct Lewis Dot structure for a nitrate ion?

☐ 

1 possible pts.

Question 33

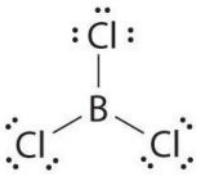
Which of the following is the correct Lewis Dot structure for nitrogen gas?

☐ 

1 possible pts.

Question 34

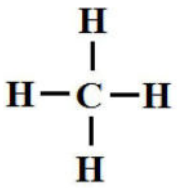
Which of the following is the correct Lewis Dot structure for boron trichloride?

☐ 

1 possible pts.

Question 35

Which of the following is the correct Lewis Dot structure for methane?

☐ 

1 possible pts.