

Deep Run High School

CHEMISTRY I: 3(A), 5(A), 7(A)

Unit 6 Test

Due Date: January 27, 2020

Instructors: Jennifer Krug, Mr. Wilson, Mrs. Tique

ID: 1964

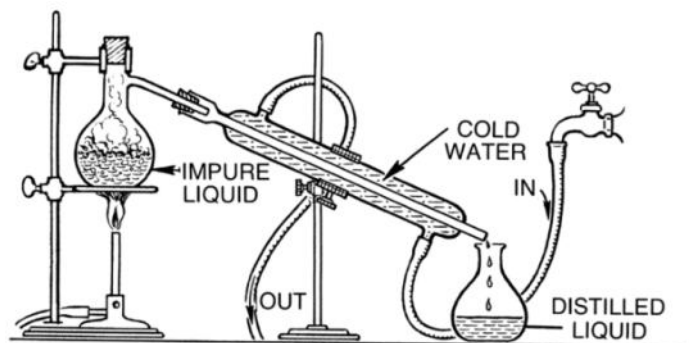
Name: _____

Score:

/ 100

Question 1

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



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

Name: _____

Question 2

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

**Ethanol****Propanol****Butanol****Pentanol**

- ☐ pentanol
- ☐ butanol
- ☐ ethanol
- ☐ propanol

Question 3

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

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

Name: _____

Question 4

Which of the following substances is a petrochemical?

- ☐ vitamin A
- ☐ insulin
- ☐ octane
- ☐ nucleic acid

Question 5

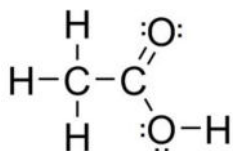
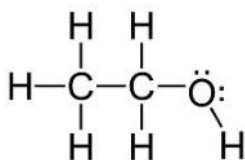
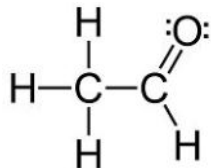
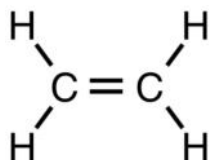
Choose the correct name for: $\text{Ca}_3(\text{PO}_4)_2$

- ☐ calcium phosphate
- ☐ calcium II phosphate
- ☐ tricalcium diphosphide
- ☐ calcium phosphoxide

Name: _____

Question 6

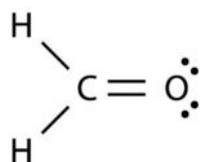
Which of the following molecules contains an aldehyde functional group?

☐☐☐☐

Name: _____

Question 7

The molecules in a sample of liquid formaldehyde, CH_2O , are attracted to each other by _____.



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

Name: _____

Question 8

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

☐ CCl_4 ☐ CO_2 ☐ PCl_3 ☐ BF_3

Question 9

Choose the correct name for: FeCO_3

☐ iron II carbonate☐ iron III carbonate☐ iron carbonate☐ iron carbonide

Name: _____

Question 10

Choose the correct name for: $\text{Sn}_3(\text{PO}_4)_4$

- ☐ tin I phosphate
- ☐ tin IV phosphate
- ☐ tin II phosphate
- ☐ tin III phosphate

Question 11

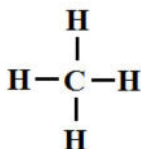
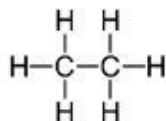
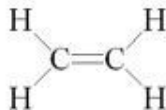
All of the following are characteristics of covalent molecules EXCEPT

- ☐ good heat insulator
- ☐ conducts electricity
- ☐ gases at room temperature
- ☐ weaker intermolecular forces

Name: _____

Question 12

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

☐☐☐☐

Question 13

Which of the following atoms exists as a diatomic molecule?

☐

neon

☐

bromine

☐

carbon

☐

helium

Name: _____

Question 14

What is the bond angle of a carbon dioxide molecule?

☐ 105°

☐ 180°

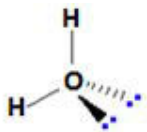
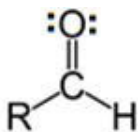
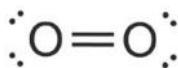
☐ 90°

☐ 120°

Name: _____

Question 15

Which of the following molecules exhibits London dispersion forces?

☐☐☐☐

Question 16

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

☐☐☐☐

Name: _____

Question 17

Choose the correct formula for: tin IV sulfide



Question 18

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

Name: _____

Question 19

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

☐

BF₃

☐

CCl₄

☐

NH₃

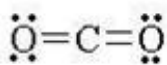
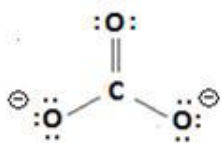
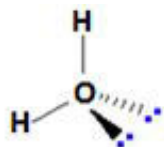
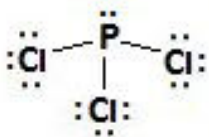
☐

HBr

Name: _____

Question 20

Which of the following molecules exhibits the strongest intermolecular forces?

☐☐☐☐

Name: _____

Question 21

Which type of intermolecular force exhibits the most polar bonds?

- ☐ London forces
- ☐ Dipole - dipole interactions
- ☐ Hydrogen bonding
- ☐ Ion-Ion attractions

Question 22

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

- ☐ Cl₂
- ☐ PCl₃
- ☐ NaCl
- ☐ H₂O

Name: _____

Question 23

Choose the correct formula for: magnesium hydroxide

☐ $\text{Mg}(\text{OH})_2$

☐ MgOH_2

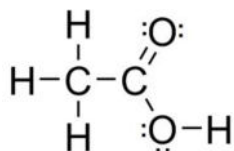
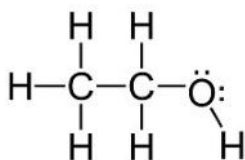
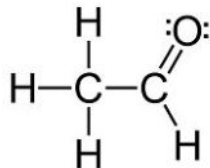
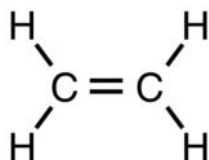
☐ MgOH

☐ Mg_2OH

Name: _____

Question 24

Which of the following molecules contains a carboxylic acid functional group?

☐☐☐☐

Name: _____

Question 25

Choose the correct formula for: calcium iodide

Question 26

All of the following possess a tetrahedral bond structure *EXCEPT* -

Name: _____

Question 27

Which of the following molecules exhibits a tetrahedral structure?



Question 28

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



Name: _____

Question 29

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

☐

CO

☐

CaO

☐

O₂

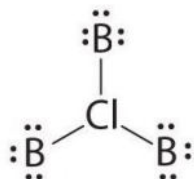
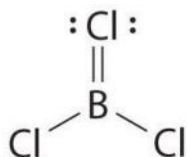
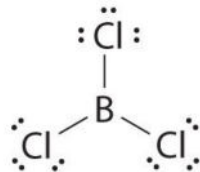
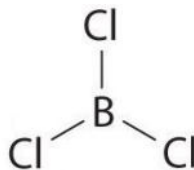
☐

CO₂

Name: _____

Question 30

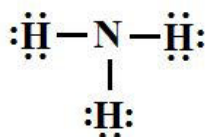
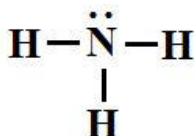
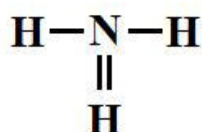
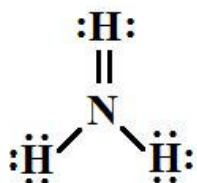
Which of the following is the correct Lewis Dot structure for boron trichloride?

☐☐☐☐

Name: _____

Question 31

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

☐☐☐☐

Name: _____

Question 32

Choose the correct name for: ZnI_2

- ☐ zinc I iodide
- ☐ zinc II iodide
- ☐ zinc iodide
- ☐ zinc iodine

Question 33

Choose the correct name for: MgO

- ☐ magnesium oxate
- ☐ magnesium oxide
- ☐ magnesium II oxide
- ☐ magnesium I oxide

Name: _____

Question 34

Choose the correct formula for: methane

☐ MnO☐ SO₂☐ CH₄☐ NH₃

Question 35

Choose the correct formula for: dinitrogen tetrachloride

☐ 4 N₂Cl☐ N₂C₄☐ 2 NCl₄☐ N₂Cl₄

Name: _____

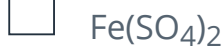
Question 36

Which of the following molecules is *least* polar?

☐☐☐☐

Question 37

Choose the correct formula for: iron II sulfate

☐☐☐☐

Name: _____

Question 38

Predict the structure of a molecule that contains 3 single bonds and 1 lone pair on the central atom.

- ☐ bent
- ☐ pyramidal
- ☐ tetrahedral
- ☐ trigonal planar

Question 39

What bond angles are present in a phosphorus trichloride molecule?

- ☐ 120°
- ☐ 105°
- ☐ 109.5°
- ☐ 107°

Name: _____

Question 40

Choose the correct name for: ICl_7

- ☐ iodine chloride VII
- ☐ iodide decachloride
- ☐ iodine sevenchloride
- ☐ iodine heptachloride

Question 41

Choose the correct name for: CO

- ☐ carbon monoxide
- ☐ carbon oxygen
- ☐ cobalt
- ☐ carbonate

Name: _____

Question 42

The dots in Lewis structures represent

- ☐ number of protons minus electrons
- ☐ number of outer electrons
- ☐ total number of protons
- ☐ total number of electrons

Question 43

What rule determines the maximum number of valence electrons allowed in the outer orbital?

- ☐ VSEPR Rule
- ☐ Octet rule
- ☐ Orbital rule
- ☐ Hund's rule

Name: _____

Question 44

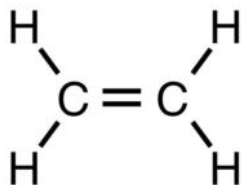
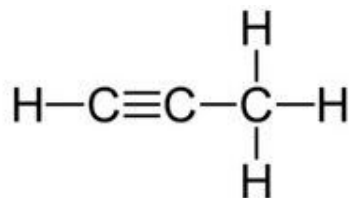
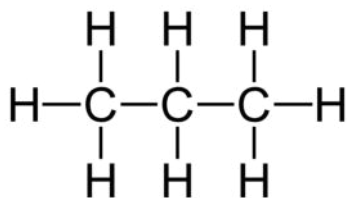
Choose the correct name for: SnCl_2

- ☐ tin IV chloride
- ☐ tin dichloride
- ☐ sodium chloride
- ☐ tin II chloride

Name: _____

Question 45

Which of the following represents an **alkane** functional group?

☐☐☐☐

Name: _____

Question 46

All of the following molecules exhibit a trigonal planar structure *EXCEPT* -



Question 47

Which of the following atoms breaks the octet rule?

☐ Boron☐ Silicon☐ Selenium☐ Arsenic

Name: _____

Question 48

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
- ☐ polar covalent
- ☐ ionic
- ☐ nonpolar covalent

Name: _____

Question 49

How many sets of lone pair electrons are located on the central atom of a bent molecule?

☐

4

☐

3

☐

1

☐

2

Question 50

What is the VSEPR shape of a dihydrogen selenide molecule?

☐

linear

☐

bent

☐

tetrahedral

☐

pyramidal

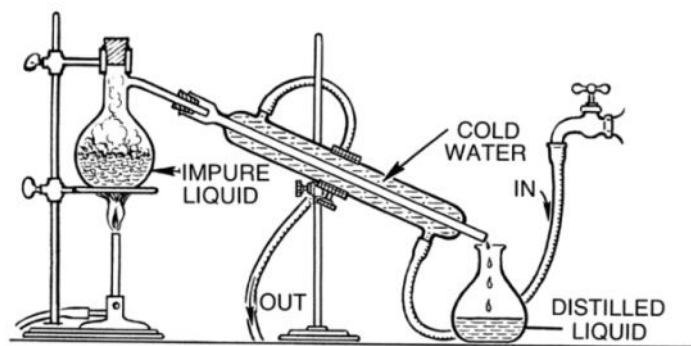
Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

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

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



boiling points

1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 2

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



Ethanol



Propanol



Butanol



Pentanol



pentanol

1 possible pts.

Question 3

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



protein

1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 4

Which of the following substances is a petrochemical?



octane

1 possible pts.

Question 5

Choose the correct name for: $\text{Ca}_3(\text{PO}_4)_2$

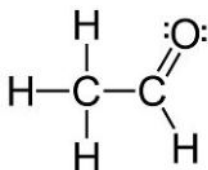


calcium phosphate

1 possible pts.

Question 6

Which of the following molecules contains an aldehyde functional group?



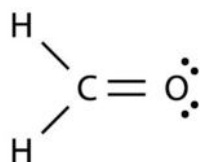
1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 7

The molecules in a sample of liquid formaldehyde, CH_2O , are attracted to each other by _____.



dipole - dipole forces

1 possible pts.

Question 8

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

 PCl_3

1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 9

Choose the correct name for: FeCO_3 

iron II carbonate

1 possible pts.

Question 10

Choose the correct name for: $\text{Sn}_3(\text{PO}_4)_4$ 

tin IV phosphate

1 possible pts.

Question 11

All of the following are characteristics of covalent molecules EXCEPT

conducts electricity

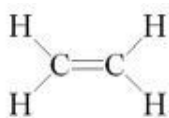
1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 12

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



1 possible pts.

Question 13

Which of the following atoms exists as a diatomic molecule?



bromine

1 possible pts.

Question 14

What is the bond angle of a carbon dioxide molecule?



180°

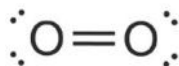
1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 15

Which of the following molecules exhibits London dispersion forces?



1 possible pts.

Question 16

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



1 possible pts.

Question 17

Choose the correct formula for: tin IV sulfide



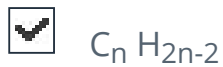
1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 18

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



1 possible pts.

Question 19

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



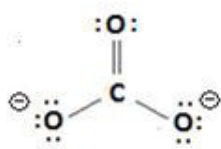
1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 20

Which of the following molecules exhibits the strongest intermolecular forces?



1 possible pts.

Question 21

Which type of intermolecular force exhibits the most polar bonds?



Ion-Ion attractions

1 possible pts.

Question 22

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



NaCl

1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 23

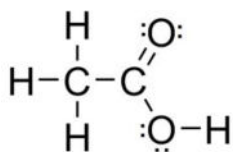
Choose the correct formula for: magnesium hydroxide

 Mg(OH)_2

1 possible pts.

Question 24

Which of the following molecules contains a carboxylic acid functional group?



1 possible pts.

Question 25

Choose the correct formula for: calcium iodide

 CaI_2

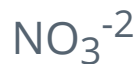
1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 26

All of the following possess a tetrahedral bond structure *EXCEPT* -



1 possible pts.

Question 27

Which of the following molecules exhibits a tetrahedral structure?



1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 28

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



1 possible pts.

Question 29

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



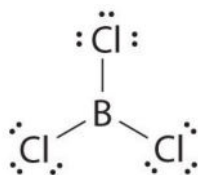
1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 30

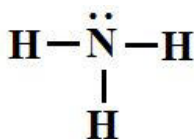
Which of the following is the correct Lewis Dot structure for boron trichloride?



1 possible pts.

Question 31

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



1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 32

Choose the correct name for: ZnI_2 

zinc iodide

1 possible pts.

Question 33

Choose the correct name for: MgO 

magnesium oxide

1 possible pts.

Question 34

Choose the correct formula for: methane

 CH_4

1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 35

Choose the correct formula for: dinitrogen tetrachloride



1 possible pts.

Question 36

Which of the following molecules is *least* polar?

1 possible pts.

Question 37

Choose the correct formula for: iron II sulfate



1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 38

Predict the structure of a molecule that contains 3 single bonds and 1 lone pair on the central atom.



pyramidal

1 possible pts.

Question 39

What bond angles are present in a phosphorus trichloride molecule?



107°

1 possible pts.

Question 40

Choose the correct name for: ICl_7



iodine heptachloride

1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 41

Choose the correct name for: CO

carbon monoxide

1 possible pts.

Question 42

The dots in Lewis structures represent

number of outer electrons

1 possible pts.

Question 43

What rule determines the maximum number of valence electrons allowed in the outer orbital?

Octet rule

1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

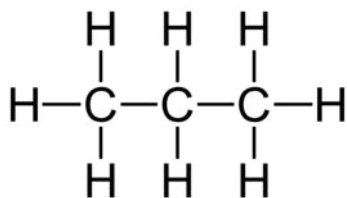
Question 44

Choose the correct name for: SnCl_2 

tin II chloride

1 possible pts.

Question 45

Which of the following represents an **alkane** functional group?

1 possible pts.

Question 46

All of the following molecules exhibit a trigonal planar structure *EXCEPT* - PCl_3

1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 47

Which of the following atoms breaks the octet rule?



Boron

1 possible pts.

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Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 48

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.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 49

How many sets of lone pair electrons are located on the central atom of a bent molecule?



2

1 possible pts.

Question 50

What is the VSEPR shape of a dihydrogen selenide molecule?



bent

1 possible pts.