

Name Key (print) Name \_\_\_\_\_ (sign)

Please show work for partial credit and full credit on the Long Answers and in some of the Short Answer Questions. Multiple choice questions have no partial credit. Please write anything you want graded legibly. If I cannot read your work, I obviously cannot grade it. (2 pts print and sign exam) If you run out of space, please continue on the back page of the exam and clearly tell me where the remaining answer can be found.  $N_A = 6.022 \times 10^{23}$

Part I MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question. No partial credit for MC. (2 pts per question, 24 pts total)

1) Isotopes differ in the number of

- A) neutrons.  
 B) beta particles.  
 C) electrons.  
 D) neutrons and protons.  
 E) protons.

1) A

2) Identify a liquid.

- A) no definite shape and definite volume  
 C) definite volume and no definite shape  
 B) no definite shape and no definite volume  
 D) definite volume and definite shape

2) C

3) Identify a cation.

- A) An atom that has gained an electron.  
 B) An atom that has lost an electron.  
 C) An atom that has gained a neutron.  
 D) An atom that has lost a proton and a neutron.

3) B

4) A student performs an experiment to determine the density of a sugar solution. She obtains the following results: 1.71 g/mL, 1.73 g/mL, 1.67 g/mL, 1.69 g/mL. If the actual value for the density of the sugar solution is 1.40 g/mL, which statement below best describes her results?

- A) Her results are both precise and accurate  
 B) Her results are accurate, but not precise.  
 C) Her results are precise, but not accurate.  
 D) Her results are neither precise nor accurate.  
 E) It isn't possible to determine with the information given.

4) C

5) The statement, "In a chemical reaction, matter is neither created nor destroyed" is called

- A) the Law of Multiple Proportions.  
 B) the Scientific Method.  
 C) the Law of Conservation of Mass.  
 D) Dalton's Atomic Theory.  
 E) the Law of Definite Proportions.

5) C

6) An ionic bond is best described as

- A) the attraction between 2 metal atoms. (not)  
B) the attraction that holds the atoms together in a polyatomic ion.  
C) the transfer of electrons from one atom to another.  
D) the attraction between 2 nonmetal atoms.  
E) the sharing of electrons. — Covalent

metal + nonmetal

6) C

7) Au is an example of

- A) a compound.  
B) a heterogeneous mixture.  
C) a homogeneous mixture.  
D) an element.

7) D

8) Identify the correct charges of the protons, neutrons, and electrons.

- A) protons +1, neutrons -1, electrons 0  
B) protons +1, neutrons 0, electrons -1  
C) protons 0, neutrons +1, electrons -1  
D) protons 0, neutrons -1, electrons +1  
E) protons -1, neutrons 0, electrons +1

8) B

9) Predict the charge that a Mg ion would have.

- A) 6-      B) 3+      C) 2-      D) 2+      E) 1+

group IIA → (+2)

9) D

10) How many significant figures are in the measurement 5.340 g?

- A) 3      B) 2      C) 5      D) 1      E) 4

10) E

11) Which of the following elements is a metal?

- A) Br      B) S      C) As      D) Kr      E) Fe

11) E

12) Which of the following are examples of intensive properties?

- A) volume  
B) mass  
C) density  
D) None of the above are examples of intensive properties.  
E) All of the above are examples of intensive properties.

independent of amount

12) C

**Part II Short Answer:** Write the word or phrase or circle the choice that best completes each statement or answers the question. Some questions may require that you show work. If you do not show work, you may lose points. Even on questions which do not require work, if you legibly show work, you may get some partial credit.

Please show all work on this exam itself. If you are going to show work on the scratch paper and want me to grade it, clearly indicate where I can find your work. (48 pts)

1. Circle the following which is an element (not a compound). (8 pts total, 2 pts each)

Mg NO<sub>2</sub> KCl SO<sub>2</sub>

2. Fill in the blanks. (6 pts total, 3 pts each)

a. 1000 mg = 1 gram      b. 1 meter = 1000 millimeters

3. For the following symbols give the element name. For the following element name, write down the element symbol. (6 pts total, 3 pts each)

Au gold      boron B

4. Given the following block directly from the periodic table, (8 pts, 1 pt each)

Al

13
Al
26.981538

a. Write the symbol for the element in the form of  ${}^A_Z X$   ${}^{27}_{13} Al$

b. How many protons? 13      c. How many electrons (for a neutral atom)? 13

c. What is the charge on the element as an ion? +3 explain or show work.

Group IIIA → +3

d. How many neutrons? 14 (show work)  $27 - 13 = 14$

e. How many atoms does one mole of the element contain  $6.022 \times 10^{23}$

f. How much does one atom of the element weigh 26.98 amu

g. How much does one mole of the element weigh 26.98 grams

pink

7 Match the following to the letters shown. The letters may only be used one time or not at all. (4 pts each, 8 pts total)

- (a) transition metal elements
- (b) lanthanide, actinide elements
- (c) main group elements
- (d) alkali metal elements
- (e) alkaline earth elements
- (f) halogens
- (g) noble gases

Periodic Table of the Elements

8 Given the following list of chemical formulas, circle all which are ionic (1 pt each, 6 pts total)

- NaCl
 P<sub>2</sub>O<sub>5</sub>
 SO<sub>2</sub>
MgF<sub>2</sub>
 NO<sub>2</sub>
KBr

9 Give the correct formula for the following elements. The ion charges are given together with the element symbol. (show work) (6 pts) Ga (+3) S (-2)

$Ga^{+3} S^{-2} \rightarrow Ga_2 S_3$ 
NW-3

or  $(\#Ga)(+3) + (\#S)(-2) = 0$

$\begin{matrix} \uparrow & & \uparrow \\ 2 & & 3 \end{matrix}$

bad attempt -4

 gave  
 $Ga_2 S_3$ 
-2

**Part III. Long Answer** Please show work for full credit and to receive partial credit. (26 pts)  
 \*\*\*\* Please attempt every problem for partial credit. You will get no partial credit if you just rewrite the question with no change in anything. \*\*\*\*

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1. Conversion Problem: (show work) (10 pts)

Convert 78.2 ounces to milligrams. (16 ounces = 1 pound, 453.59 grams = 1 pound)

$$\begin{array}{cccc}
 2\text{pt} & 2\text{pt} & 2\text{pt} & 2\text{pt} \\
 78.2 \text{ ounces} \times \frac{1 \text{ pound}}{16 \text{ ounces}} \times \frac{453.59 \text{ g}}{1 \text{ pound}} \times \frac{1000 \text{ mg}}{1 \text{ g}} =
 \end{array}$$

$$\underline{2216921.125} \rightarrow 3 \text{ sig fig}$$

$$2.22 \times 10^6 \text{ mg}$$

2pt ↑

attempt -4  
 bad attempt -6  
 really bad attempt -8  
 math -1

step half wrong -1  
 (top or bottom)

extra wrong step -1

upside down -1  
 step

2. For the element Na (16 pts total)

230k

a. What is the mass of one mole of the element? 22,98977 grams (4 pts)

b. How many grams does 2.55 moles weigh? show work. (6 pts)

$$2.55 \text{ mol Na} \times \frac{22,98977 \text{ g}}{1 \text{ mol Na}} = 58.6 \text{ g Na}$$

2pt

2pt

2pt

c. How many atoms do you have in that many moles? (show work). (6 pts)

$$2.55 \text{ mol Na} \times \frac{6.022 \times 10^{23} \text{ atoms}}{1 \text{ mol Na}} = 1.54 \times 10^{24} \text{ atoms}$$

2pt

2pt

2pt

attempt -3

bad attempt -4

really bad attempt -5

extra wrong step -1

upside down step -1

step 1/2 wrong (top or bottom) -1

math -1

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Part I MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question. No partial credit for MC. (2 pts per question, 24 pts total)

- 1) Au is an example of 1) D  
 A) a homogeneous mixture. B) a compound.  
 C) a heterogeneous mixture.  D) an element.
- 2) A student performs an experiment to determine the density of a sugar solution. She obtains the following results: 1.71 g/mL, 1.73 g/mL, 1.67 g/mL, 1.69 g/mL. If the actual value for the density of the sugar solution is 1.40 g/mL, which statement below best describes her results? 2) C  
 A) Her results are neither precise nor accurate.  
 B) Her results are both precise and accurate  
 C) Her results are precise, but not accurate.  
 D) Her results are accurate, but not precise.  
 E) It isn't possible to determine with the information given.
- 3) The statement, "In a chemical reaction, matter is neither created nor destroyed" is called 3) C  
 A) the Scientific Method.  
 B) the Law of Multiple Proportions.  
 C) the Law of Conservation of Mass.  
 D) Dalton's Atomic Theory.  
 E) the Law of Definite Proportions.
- 4) Identify a cation. 4) B  
 A) An atom that has gained an electron.  
 B) An atom that has lost an electron.  
 C) An atom that has gained a neutron.  
 D) An atom that has lost a proton and a neutron.
- 5) Identify a liquid. 5) D  
 A) definite volume and definite shape B) no definite shape and definite volume  
 C) no definite shape and no definite volume  D) definite volume and no definite shape *same*
- 6) Isotopes differ in the number of 6) C  
 A) protons.  
 B) beta particles.  
 C) neutrons.  
 D) neutrons and protons.  
 E) electrons.

7) How many significant figures are in the measurement 5.340 g?

- A) 5                      B) 2                      C) 3                      D) 1

E) 4

7) E

8) Identify the correct charges of the protons, neutrons, and electrons.

- A) protons +1, neutrons -1, electrons 0  
B) protons -1, neutrons 0, electrons +1  
C) protons 0, neutrons +1, electrons -1  
 D) protons +1, neutrons 0, electrons -1  
E) protons 0, neutrons -1, electrons +1

8) D

9) Which of the following are examples of intensive properties?

- A) density  
B) volume  
C) mass  
D) None of the above are examples of intensive properties.  
E) All of the above are examples of intensive properties.

9) A

10) Which of the following elements is a metal?

- A) Fe                      B) S                      C) Kr                      D) Br                      E) As

10) A

11) Predict the charge that a Mg ion would have.

- A) 6-                      B) 3+                      C) 2-                      D) 1+

E) 2+

11) E

12) An ionic bond is best described as

- A) the attraction between 2 metal atoms.  
B) the attraction that holds the atoms together in a polyatomic ion.  
C) the sharing of electrons.  
 D) the transfer of electrons from one atom to another.  
E) the attraction between 2 nonmetal atoms.

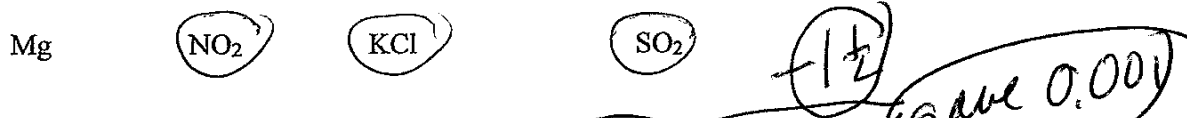
12) D



**Part II Short Answer:** Write the word or phrase or circle the choice that best completes each statement or answers the question. Some questions may require that you show work. If you do not show work, you may lose points. Even on questions which do not require work, if you legibly show work, you may get some partial credit.

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1. Circle the following which is a **Compound (not an element)** (8 pts total, 2 pts each)



2. Fill in the blanks. (6 pts total, 3 pts each)

a. 1 liter = 100 centiliter      gave 0.01      b. 1000 milliliter = liters

3. For the following symbols give the element name. For the following element name, write down the element symbol. (6 pts total, 3 pts each)

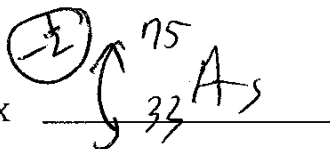
Manganese Mn      F fluorine      gave fluoride - 1

4. Given the following block directly from the periodic table, (8 pts, 1 pt each)

33
As
74.92160

As

- a. Write the symbol for the element in the form of  ${}^A_Z X$



- b. How many protons? 33      c. How many electrons (for a neutral atom)? 33

- d. What is the charge on the element as an ion? -3 explain or show work

group VA → 5-8 = -3      gave -3      -1/2      NW -1/2      sign -1/2

- e. How many neutrons? 42 (show work)

75 - 33 = 42      NW -1/2

- f. How many atoms does **one mole** of the element contain  $6.022 \times 10^{23}$

- g. How much does **one atom** of the element weigh 74.92 amu

- h. How much does **one mole** of the element weigh 74.92 grams

7 Match the following to the letters shown. The letters may only be used one time or not at all. (4 pts each, 8 pts total)

- (a) transition metal elements (b) lanthanide, actinide elements (c) main group elements  
 (d) alkali metal elements (e) alkaline earth elements (f) halogens (g) noble gases

Periodic Table of the Elements

8 Given the following list of chemical formulas, circle all which are covalent (1 pt each, 6 pts total)

Na Cl

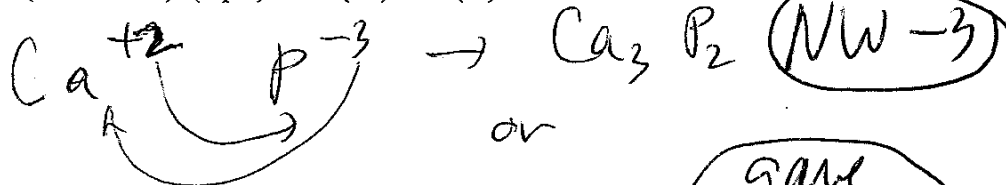


MgF<sub>2</sub>



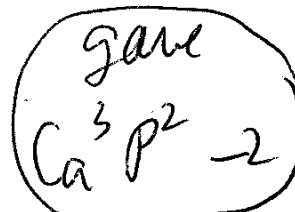
KBr

9 Give the correct formula for the following elements. The ion charges are given together with the element symbol. (show work) (6 pts) Ca (+2) P (-3)



$$(\#Ca)(+2) + (\#P)(-3) = 0$$

$\uparrow$                        $\uparrow$   
 3                      2



bad attempt -4

**Part III. Long Answer** Please show work for full credit and to receive partial credit. (26 pts)

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Please show all work on this exam itself. If you are going to show work on the scratch paper and want me to grade it, clearly indicate where I can find your work otherwise, I obviously cannot grade work I cannot find.

1. Conversion Problem: (show work) (10 pts)

Convert 78.2 feet to meters. (12 inches = 1 foot, 2.54 cm = 1 inch)

$$\begin{array}{ccccccc} \textcircled{2\text{pt}} & & \textcircled{2\text{pt}} & & \textcircled{2\text{pt}} & & \textcircled{2\text{pt}} \\ 78.2 & \times & \frac{12 \text{ inches}}{1 \text{ foot}} & \times & \frac{2.54 \text{ cm}}{1 \text{ inch}} & \times & \frac{1 \text{ meter}}{100 \text{ cm}} = \end{array}$$

*(Note: The units "Feet", "inches", "cm", and "meters" are written below their respective terms in the original image.)*

23.8 meters

$\textcircled{2\text{pt}}$

attempt -4  
bad attempt -6  
really bad attempt -8  
math -1

extra wrong step -1  
upside down step -1  
step half wrong (top or bottom) -1

2. For the element P (16 pts total)

310k

a. What is the mass of one mole of the element? 30.97 grams (4 pts)

b. How many grams does 82.2 moles weigh? (show work) (6 pts)

$$82.2 \text{ mol P} \times \frac{30.97 \text{ g P}}{1 \text{ mol P}} = 2545.734$$

4 sig fig  $2.55 \times 10^3 \text{ g P}$

c. How many atoms do you have in that many moles? (show work). (6 pts)

$$82.2 \text{ mol P} \times \frac{6.022 \times 10^{23} \text{ atoms P}}{1 \text{ mol P}} =$$

$$4.95 \times 10^{25} \text{ atoms P}$$

attempt -3

math-1

bad attempt -4

really bad attempt -5

extra wrong step -1

upside down step -1

step half wrong (top or bottom) -1

green

Name Key (print) Name \_\_\_\_\_ (sign)

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Part I MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question. No partial credit for MC. (2 pts per question, 24 pts total)

- 1) A student performs an experiment to determine the density of a salt solution. She obtains the following results: 1.79 g/mL, 1.81 g/mL, 1.80 g/mL, 1.81 g/mL. If the actual value for the density of the salt solution is 1.80 g/mL, which statement below best describes her results? 1) C
- A) Her results are accurate, but not precise.
  - B) Her results are neither precise nor accurate.
  - C) Her results are both precise and accurate.
  - D) Her results are precise, but not accurate.
  - E) It isn't possible to determine with the information given.
- Close to actual accurate*

- 2) Identify a solid. 2) B
- A) no definite shape and no definite volume
  - B) definite volume and definite shape
  - C) no definite shape and definite volume
  - D) definite volume and no definite shape
- same*

- 3) Which of the following are examples of extensive properties? 3) E
- A) odor
  - B) density
  - C) color
  - D) temperature
  - E) mass
- Dependent on amounts*

- 4) Identify the correct description of an atom. 4) A
- A) protons and neutrons in nucleus; electrons in orbitals
  - B) protons and electrons in nucleus; neutrons in orbitals
  - C) neutrons in nucleus; protons and electrons in orbitals
  - D) neutrons and electrons in nucleus; protons in orbitals
  - E) electrons in nucleus; protons and neutrons in orbitals

- 5) Which of the following elements is a nonmetal? 5) C
- A) Ni      B) Be       C) Br      D) K      E) Ce

- 6) Identify an anion. 6) D
- A) An atom that has lost a neutron and a proton.
  - B) An atom that has gained a neutron.
  - C) An atom that has lost an electron.
  - D) An atom that has gained an electron.

7)  $H_2O$  is an example of

- A) a compound.  
 C) a homogeneous mixture.

- B) a heterogeneous mixture.  
 D) an element.

7) A

8) Predict the charge that an ion formed from  $Se^-$  would have.

A) 1-

B) 3-

C) 6+

D) 2-

E) 4+

8) D

9) Which of the following exists as a diatomic molecule?

- A) krypton  
B) lithium  
C) phosphorus  
D) carbon  
 E) hydrogen

Group VIA  
 $6 - 8 = -2$

9) E

10) How many significant figures are in 0.00523980 mL?

A) 5

B) 7

C) 6

D) 4

E) 3

10) C

11) A covalent bond is best described as

- A) the transfer of electrons.  
 B) the sharing of electrons between atoms.  
C) a bond between two polyatomic ions. ~ ionic, ionic  
D) a bond between a metal and a nonmetal. ~ ionic  
E) a bond between a metal and a polyatomic ion. ~ ionic

11) B

12) In a chemical reaction, matter is neither created or destroyed. Which law does this refer to?

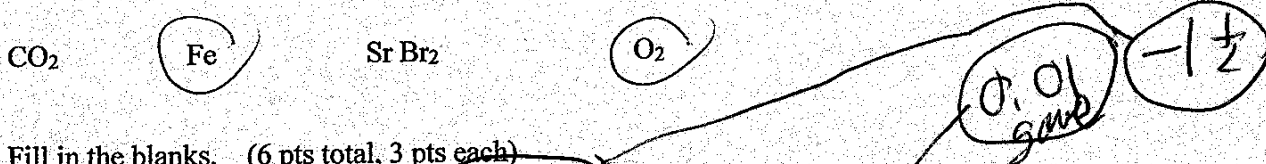
- A) Law of Definite Proportions  
B) Law of Modern Atomic Theory  
C) First Law of Thermodynamics  
 D) Law of the Conservation of Mass  
E) Law of Multiple Proportions

12) D

**Part II Short Answer:** Write the word or phrase or circle the choice that best completes each statement or answers the question. Some questions may require that you show work. If you do not show work, you may lose points. Even on questions which do not require work, if you legibly show work, you may get some partial credit.

Please show all work on this exam itself. If you are going to show work on the scratch paper and want me to grade it, clearly indicate where I can find your work. (48 pts)

1. Circle the following which is an element. (not a Compound) (8 pts total, 2 pts each)



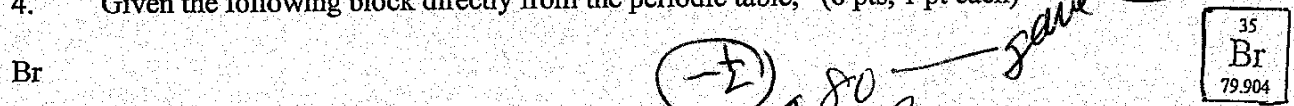
2. Fill in the blanks. (6 pts total, 3 pts each)

a. 1000 mL = 1 liter *gave 0,001*      b. 1 meter = 100 cm

3. For the following symbols give the element name. For the following element name, write down the element symbol. (6 pts total, 3 pts each)

Zn zinc      oxygen O

4. Given the following block directly from the periodic table, (8 pts, 1 pt each)



a. Write the symbol for the element in the form of  ${}^A_Z X$   ${}^{80}_{35} Br$

b. How many protons? 35      c. How many electrons (for a neutral atom)? 35

d. What is the charge on the element as an ion? -1 explain or show work. *group VII A → 7-8 = -1* *Handwritten notes: "NW -1/2" and "gave -1 -1/2" circled.*

e. How many neutrons? 45 (show work)  
 $80 - 35 = 45$  *NW -1/2*

f. How many atoms does one mole of the element contain  $6.022 \times 10^{23}$  atoms

g. How much does one atom of the element weigh 79.90 amu

h. How much does one mole of the element weigh 79.90 grams *gave 80 OK*





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1. Conversion Problem: (show work) (10 pts)

Convert 13.78 milliliters to cups (1 Liter = 1.0567 quarts, 4 cups = 1 quart)

$$13.78 \text{ ml} \times \frac{1 \text{ L}}{1000 \text{ ml}} \times \frac{1.0567 \text{ qt.}}{1 \text{ L}} \times \frac{4 \text{ cups}}{1 \text{ qt.}}$$

$$= 0.05825 \text{ cups}$$

4 sig figs

attempt -4

bad attempt -6

really bad attempt -8

math -1

extra wrong step -1

upside down step -1

step half wrong (top or bottom) -1

2. For the element S (16 pts total)

32.06

a. What is the mass of one mole of the element? 32.066 grams (4 pts)

b. How many grams does 0.278 moles weigh? show work. (6 pts)

$$0.278 \text{ mol} \times \frac{32.066 \text{ g}}{1 \text{ mol}} = 8.91 \text{ g}$$

(2pt) (2pt) (2pt)

c. How many atoms do you have in that many moles? (show work). (6 pts)

$$0.278 \text{ mol} \times \frac{6.022 \times 10^{23} \text{ atoms}}{1 \text{ mol}} =$$

(2pt) (2pt)

$$1.67 \times 10^{23} \text{ atoms}$$

(2pt)

math -1  
attempt -3  
bad attempt -4  
really bad attempt -5  
extra wrong step -1  
upside down step -1  
step 1/2 wrong (top or bottom) -1

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Part I MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question. No partial credit for MC. (2 pts per question, 24 pts total)

- 1) How many significant figures are in 0.00523980 mL? 1) B  
 A) 4       B) 6      C) 7      D) 5      E) 3
- 2) Identify the correct description of an atom. 2) A  
 A) protons and neutrons in nucleus; electrons in orbitals  
 B) neutrons in nucleus; protons and electrons in orbitals  
 C) electrons in nucleus; protons and neutrons in orbitals  
 D) protons and electrons in nucleus; neutrons in orbitals  
 E) neutrons and electrons in nucleus; protons in orbitals
- 3) A covalent bond is best described as 3) D  
 A) the transfer of electrons.  
 B) a bond between two polyatomic ions.  
 C) a bond between a metal and a polyatomic ion.  
 D) the sharing of electrons between atoms.  
 E) a bond between a metal and a nonmetal.
- 4) Which of the following are examples of extensive properties? 4) D  
 A) color  
 B) density  
 C) temperature  
 D) mass  
 E) odor
- 5) Predict the charge that an ion formed from Se would have. 5) B  
 A) 3-       B) 2-      C) 4+      D) 1-      E) 6+
- 6) In a chemical reaction, matter is neither created or destroyed. Which law does this refer to? 6) D  
 A) Law of Definite Proportions  
 B) Law of Multiple Proportions  
 C) Law of Modern Atomic Theory  
 D) Law of the Conservation of Mass  
 E) First Law of Thermodynamics
- 7) Which of the following elements is a nonmetal? 7) C  
 A) Ni      B) K       C) Br      D) Be      E) Ce

- 8) Identify an anion. 8) B  
A) An atom that has lost a neutron and a proton.  
 B) An atom that has gained an electron.  
C) An atom that has lost an electron.  
D) An atom that has gained a neutron.
- 9)  $H_2O$  is an example of 9) B  
A) a homogeneous mixture.  
C) an element.  B) a compound.  
D) a heterogeneous mixture.
- 10) Which of the following exists as a diatomic molecule? 10) E  
A) phosphorus  
B) carbon  
C) lithium  
D) krypton  
 E) hydrogen
- 11) Identify a solid. 11) A  
 A) definite volume and definite shape  
C) definite volume and no definite shape ↗ B) no definite shape and definite volume  
↖ D) no definite shape and no definite volume
- 12) A student performs an experiment to determine the density of a salt solution. She obtains the following results: 1.79 g/mL, 1.81 g/mL, 1.80 g/mL, 1.81 g/mL. If the actual value for the density of the salt solution is 1.80 g/mL, which statement below best describes her results? 12) C  
A) Her results are precise, but not accurate.  
B) Her results are neither precise nor accurate.  
 C) Her results are both precise and accurate  
D) Her results are accurate, but not precise.  
E) It isn't possible to determine with the information given.

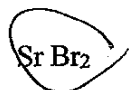
**Part II Short Answer:** Write the word or phrase or circle the choice that best completes each statement or answers the question. Some questions may require that you show work. If you do not show work, you may lose points. Even on questions which do not require work, if you legibly show work, you may get some partial credit.

Please show all work on this exam itself. If you are going to show work on the scratch paper and want me to grade it, clearly indicate where I can find your work. (48 pts)

1. Circle the following which is a **Compound** (not element) (8 pts total, 2 pts each)



Fe



O<sub>2</sub>

2. Fill in the blanks. (6 pts total, 3 pts each)

a. 1 kilogram = 1000 grams

b. 1 km = 1000 meters

gave 0,001  
-1/2

3. For the following symbols give the element name. For the following element name, write down the element symbol. (6 pts total, 3 pts each)

Pt platinum

carbon C

4. Given the following block directly from the periodic table, (8 pts, 1 pt each)

Be

4
Be
9.012182

a. Write the symbol for the element in the form of  ${}^A_Z X$   ${}^9_4 Be$

b. How many protons? 4 c. How many electrons (for a neutral atom)? 4

d. What is the charge on the element as an ion? +2 explain or show work.

group IIA → +2 (MW - 2)

e. How many neutrons? 5 (show work)

$9 - 4 = 5$

f. How many atoms does **one mole** of the element contain  $6.022 \times 10^{23}$  atoms

g. How much does **one atom** of the element weigh 9.01 amu

h. How much does **one mole** of the element weigh 9.01 grams

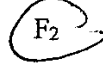
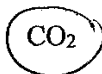
gave 9  
OK

7 Match the following to the letters shown. The letters may only be used one time or not at all. (4 pts each, 8 pts total)

- (a) transition metal elements (b) lanthanide, actinide elements (c) main group elements (d) alkali metal elements (e) alkaline earth elements (f) halogens (g) noble gases

Periodic Table of the Elements

8 Given the following list of chemical formulas, circle all which are **covalent** (1 pt each, 6 pts total)



9 Give the correct formula for the following elements. The ion charges are given together with the element symbol. (show work) (6 pts) K(+1) N(-3)

$$K^{+1} \quad N^{-3} \rightarrow K_3 N$$
  

$$(\#K)(+1) + (\#N)(-3) = 0$$
  

$$3(+1) + 1(-3) = 0$$

NW-3

gone

K<sub>3</sub>N-2

bad attempt -4

**Part III. Long Answer** Please show work for full credit and to receive partial credit. (26 pts)

\*\*\*\* Please attempt every problem for partial credit. You will get no partial credit if you just rewrite the question with no change in anything.\*\*\*\*

Please show all work on this exam itself. If you are going to show work on the scratch paper and want me to grade it, clearly indicate where I can find your work otherwise, I obviously cannot grade work I cannot find.

1. Conversion Problem: (show work) (10 pts)

Convert 13.78 kilograms to ounces (453.59 grams = 1 pound, 16 ounces = 1 pound)

$$13.78 \text{ kg} \times \frac{1000 \text{ g}}{1 \text{ kg}} \times \frac{1 \text{ pound}}{453.59 \text{ g}} \times \frac{16 \text{ ounces}}{1 \text{ pound}}$$

$$= 486.1 \text{ ounces}$$

(2pt)

attempt -4

bad attempt to

really bad attempt 8

math -1

extra wrong step -1

upside down step -1

step half wrong (top or bottom) -1

2. For the element Se (16 pts total)

79 OK

a. What is the mass of one mole of the element? 78.96 grams (4 pts)

b. How many grams does 0.0672 moles weigh? (show work.) (6 pts)

$$\begin{array}{l} 0.0672 \text{ mol} \\ \text{Se} \end{array} \times \frac{78.96 \text{ g Se}}{1 \text{ mol Se}} = 5.31 \text{ g Se}$$

(2pt) (2pt) (2pt)

c. How many atoms do you have in that many moles? (show work). (6 pts)

$$\begin{array}{l} 0.0672 \\ \text{mol} \\ \text{Se} \end{array} \times \frac{6.022 \times 10^{23} \text{ atoms Se}}{1 \text{ mol Se}} =$$

(2pt) (2pt)

$$4.05 \times 10^{22} \text{ atoms Se}$$

(2pt)

math

attempt -3  
bad attempt -4  
really bad attempt -5  
extra wrong step -1  
upside down step -1  
step 1/2 wrong (top or bottom) -1



Name \_\_\_\_\_ (print) Name \_\_\_\_\_ (sign)

Please show work for partial credit and full credit on the Long Answers and in some of the Short Answer Questions. Multiple choice questions have no partial credit. Please write anything you want graded legibly. If I cannot read your work, I obviously cannot grade it. (2 pts print and sign exam) If you run out of space, please continue on the back page of the exam and clearly tell me where the remaining answer can be found.  $N_A = 6.022 \times 10^{23}$

**Part I MULTIPLE CHOICE.** Choose the one alternative that best completes the statement or answers the question.  
No partial credit for MC. (2 pts per question, 24 pts total)

- 1) Isotopes differ in the number of \_\_\_\_\_ 1) \_\_\_\_\_  
A) neutrons.  
B) beta particles.  
C) electrons.  
D) neutrons and protons.  
E) protons.
- 2) Identify a liquid. \_\_\_\_\_ 2) \_\_\_\_\_  
A) no definite shape and definite volume  
B) no definite shape and no definite volume  
C) definite volume and no definite shape  
D) definite volume and definite shape
- 3) Identify a cation. \_\_\_\_\_ 3) \_\_\_\_\_  
A) An atom that has gained an electron.  
B) An atom that has lost an electron.  
C) An atom that has gained a neutron.  
D) An atom that has lost a proton and a neutron.
- 4) A student performs an experiment to determine the density of a sugar solution. She obtains the following results: 1.71 g/mL, 1.73 g/mL, 1.67 g/mL, 1.69 g/mL. If the actual value for the density of the sugar solution is 1.40 g/mL, which statement below best describes her results? \_\_\_\_\_ 4) \_\_\_\_\_  
A) Her results are both precise and accurate  
B) Her results are accurate, but not precise.  
C) Her results are precise, but not accurate.  
D) Her results are neither precise nor accurate.  
E) It isn't possible to determine with the information given.
- 5) The statement, "In a chemical reaction, matter is neither created nor destroyed" is called \_\_\_\_\_ 5) \_\_\_\_\_  
A) the Law of Multiple Proportions.  
B) the Scientific Method.  
C) the Law of Conservation of Mass.  
D) Dalton's Atomic Theory.  
E) the Law of Definite Proportions.

- 6) An ionic bond is best described as \_\_\_\_\_  
A) the attraction between 2 metal atoms.  
B) the attraction that holds the atoms together in a polyatomic ion.  
C) the transfer of electrons from one atom to another.  
D) the attraction between 2 nonmetal atoms.  
E) the sharing of electrons.
- 7) Au is an example of \_\_\_\_\_  
A) a compound.  
B) a heterogeneous mixture.  
C) a homogeneous mixture.  
D) an element.
- 8) Identify the correct charges of the protons, neutrons, and electrons. \_\_\_\_\_  
A) protons +1, neutrons -1, electrons 0  
B) protons +1, neutrons 0, electrons -1  
C) protons 0, neutrons +1, electrons -1  
D) protons 0, neutrons -1, electrons +1  
E) protons -1, neutrons 0, electrons +1
- 9) Predict the charge that a Mg ion would have. \_\_\_\_\_  
A) 6-                      B) 3+                      C) 2-                      D) 2+                      E) 1+
- 10) How many significant figures are in the measurement 5.340 g? \_\_\_\_\_  
A) 3                      B) 2                      C) 5                      D) 1                      E) 4
- 11) Which of the following elements is a metal? \_\_\_\_\_  
A) Br                      B) S                      C) As                      D) Kr                      E) Fe
- 12) Which of the following are examples of intensive properties? \_\_\_\_\_  
A) volume  
B) mass  
C) density  
D) None of the above are examples of intensive properties.  
E) All of the above are examples of intensive properties.

**Part II Short Answer:** Write the word or phrase or circle the choice that best completes each statement or answers the question. Some questions may require that you show work. If you do not show work, you may lose points. Even on questions which do not require work, if you legibly show work, you may get some partial credit.

Please show all work on this exam itself. If you are going to show work on the scratch paper and want me to grade it, clearly indicate where I can find your work. (48 pts)

1. Circle the following which is an element (not a compound). (8 pts total, 2 pts each)

Mg            NO<sub>2</sub>            KCl            SO<sub>2</sub>

2. Fill in the blanks. (6 pts total, 3 pts each)

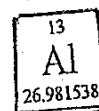
a. \_\_\_\_\_ mg = 1 gram            b. 1 meter = \_\_\_\_\_ millimeters

3. For the following symbols give the element name. For the following element name, write down the element symbol. (6 pts total, 3 pts each)

Au \_\_\_\_\_            boron \_\_\_\_\_

4. Given the following block directly from the periodic table, (8 pts, 1 pt each)

Al



a. Write the symbol for the element in the form of  ${}^A_Z X$  \_\_\_\_\_

b. How many protons? \_\_\_\_\_ c. How many electrons (for a neutral atom)? \_\_\_\_\_

c. What is the charge on the element as an ion? \_\_\_\_\_ explain or show work.

d. How many neutrons? \_\_\_\_\_ (show work)

e. How many atoms does **one mole** of the element contain \_\_\_\_\_

f. How much does **one atom** of the element weigh \_\_\_\_\_ amu

g. How much does **one mole** of the element weigh \_\_\_\_\_ grams

pink

7 Match the following to the letters shown. The letters may only be used one time or not at all. (4 pts each, 8 pts total)

- (a) transition metal elements (b) lanthanide, actinide elements (c) main group elements (d) alkali metal elements (e) alkaline earth elements (f) halogens (g) noble gases

Periodic Table of the Elements

1	H	He																	H	He
2	Li	Be											B	C	N	O	F	Ne		
3	Na	Mg											Al	Si	P	S	Cl	Ar		
4	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr		
5	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe		
6	Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn		
7	Fr	Ra	Ac	Rf	Mf	Sf	Bh	Hs	Mt	Ds	Rg	Cn	Fl	Mc	Lv	Ts	Og			

Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

8 Given the following list of chemical formulas, circle all which are **ionic** (1 pt each, 6 pts total)

- Na Cl      P<sub>2</sub>O<sub>5</sub>      SO<sub>2</sub>      MgF<sub>2</sub>      NO<sub>2</sub>      KBr

9 Give the correct formula for the following elements. The ion charges are given together with the element symbol. (show work) Ga (+3) S (-2)

**Part III. Long Answer** Please show work for full credit and to receive partial credit. (26 pts)  
**\*\*\*\* Please attempt every problem for partial credit. You will get no partial credit if you just rewrite the question with no change in anything.\*\*\*\***

**Please show all work on this exam itself. If you are going to show work on the scratch paper and want me to grade it, clearly indicate where I can find your work otherwise, I obviously cannot grade work I cannot find.**

1. Conversion Problem: (show work) (10 pts)

Convert 78.2 ounces to milligrams. (16 ounces = 1 pound, 453.59 grams = 1 pound)

2. For the element Na (16 pts total)

a. What is the mass of one mole of the element? \_\_\_\_\_ grams (4 pts)

b. How many grams does 2.55 moles weigh? show work. (6 pts)

c. How many atoms do you have in that many moles? (show work). (6 pts)

Name \_\_\_\_\_ (print) Name \_\_\_\_\_ (sign)

Please show work for partial credit and full credit on the Long Answers and in some of the Short Answer Questions. Multiple choice questions have no partial credit. Please write anything you want graded legibly. If I cannot read your work, I obviously cannot grade it. (2 pts print and sign exam) If you run out of space, please continue on the back page of the exam and clearly tell me where the remaining answer can be found.  $N_A = 6.022 \times 10^{23}$

**Part I MULTIPLE CHOICE.** Choose the one alternative that best completes the statement or answers the question. No partial credit for MC. (2 pts per question, 24 pts total)

- 1) Au is an example of \_\_\_\_\_  
A) a homogeneous mixture. B) a compound.  
C) a heterogeneous mixture. D) an element.
- 2) A student performs an experiment to determine the density of a sugar solution. She obtains the following results: 1.71 g/mL, 1.73 g/mL, 1.67 g/mL, 1.69 g/mL. If the actual value for the density of the sugar solution is 1.40 g/mL, which statement below best describes her results? \_\_\_\_\_  
A) Her results are neither precise nor accurate.  
B) Her results are both precise and accurate  
C) Her results are precise, but not accurate.  
D) Her results are accurate, but not precise.  
E) It isn't possible to determine with the information given.
- 3) The statement, "In a chemical reaction, matter is neither created nor destroyed" is called \_\_\_\_\_  
A) the Scientific Method.  
B) the Law of Multiple Proportions.  
C) the Law of Conservation of Mass.  
D) Dalton's Atomic Theory.  
E) the Law of Definite Proportions.
- 4) Identify a cation. \_\_\_\_\_  
A) An atom that has gained an electron.  
B) An atom that has lost an electron.  
C) An atom that has gained a neutron.  
D) An atom that has lost a proton and a neutron.
- 5) Identify a liquid. \_\_\_\_\_  
A) definite volume and definite shape B) no definite shape and definite volume  
C) no definite shape and no definite volume D) definite volume and no definite shape
- 6) Isotopes differ in the number of \_\_\_\_\_  
A) protons.  
B) beta particles.  
C) neutrons.  
D) neutrons and protons.  
E) electrons.

- 7) How many significant figures are in the measurement 5.340 g? \_\_\_\_\_  
A) 5                      B) 2                      C) 3                      D) 1                      E) 4
- 8) Identify the correct charges of the protons, neutrons, and electrons. \_\_\_\_\_  
A) protons +1, neutrons -1, electrons 0  
B) protons -1, neutrons 0, electrons +1  
C) protons 0, neutrons +1, electrons -1  
D) protons +1, neutrons 0, electrons -1  
E) protons 0, neutrons -1, electrons +1
- 9) Which of the following are examples of intensive properties? \_\_\_\_\_  
A) density  
B) volume  
C) mass  
D) None of the above are examples of intensive properties.  
E) All of the above are examples of intensive properties.
- 10) Which of the following elements is a metal? \_\_\_\_\_  
A) Fe                      B) S                      C) Kr                      D) Br                      E) As
- 11) Predict the charge that a Mg ion would have. \_\_\_\_\_  
A) 6-                      B) 3+                      C) 2-                      D) 1+                      E) 2+
- 12) An ionic bond is best described as \_\_\_\_\_  
A) the attraction between 2 metal atoms.  
B) the attraction that holds the atoms together in a polyatomic ion.  
C) the sharing of electrons.  
D) the transfer of electrons from one atom to another.  
E) the attraction between 2 nonmetal atoms.



**Part II Short Answer:** Write the word or phrase or circle the choice that best completes each statement or answers the question. Some questions may require that you show work. If you do not show work, you may lose points. Even on questions which do not require work, if you legibly show work, you may get some partial credit.

Please show all work on this exam itself. If you are going to show work on the scratch paper and want me to grade it, clearly indicate where I can find your work. (48 pts)

1. Circle the following which is a **Compound (not an element)** (8 pts total, 2 pts each)

Mg            NO<sub>2</sub>            KCl            SO<sub>2</sub>

2. Fill in the blanks. (6 pts total, 3 pts each)

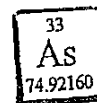
a. 1 liter = \_\_\_\_\_ centiliter            b. \_\_\_\_\_ milliliter = liters

3. For the following symbols give the element name. For the following element name, write down the element symbol. (6 pts total, 3 pts each)

Manganese \_\_\_\_\_            F \_\_\_\_\_

4. Given the following block directly from the periodic table, (8 pts, 1 pt each)

As



- a. Write the symbol for the element in the form of  ${}^A_Z X$  \_\_\_\_\_
- b. How many protons? \_\_\_\_\_    c. How many electrons (for a neutral atom)? \_\_\_\_\_
- d. What is the charge on the element as an ion? \_\_\_\_\_ explain or show work.
- e. How many neutrons? \_\_\_\_\_ (show work)
- f. How many atoms does **one mole** of the element contain \_\_\_\_\_
- g. How much does **one atom** of the element weigh \_\_\_\_\_ amu
- h. How much does **one mole** of the element weigh \_\_\_\_\_ grams

7 Match the following to the letters shown. The letters may only be used one time or not at all. (4 pts each, 8 pts total)

- (a) transition metal elements (b) lanthanide, actinide elements (c) main group elements  
 (d) alkali metal elements (e) alkaline earth elements (f) halogens (g) noble gases

Periodic Table of the Elements

8 Given the following list of chemical formulas, circle all which are **covalent** (1 pt each, 6 pts total)

Na Cl      P<sub>2</sub>O<sub>5</sub>      SO<sub>2</sub>      MgF<sub>2</sub>      NO<sub>2</sub>      KBr

9 Give the correct formula for the following elements. The ion charges are given together with the element symbol. (show work) (6 pts) **Ca (+2)**    **P (-3)**

**Part III. Long Answer** Please show work for full credit and to receive partial credit. (26 pts)  
**\*\*\*\* Please attempt every problem for partial credit. You will get no partial credit if you just rewrite the question with no change in anything.\*\*\*\***

**Please show all work on this exam itself. If you are going to show work on the scratch paper and want me to grade it, clearly indicate where I can find your work otherwise, I obviously cannot grade work I cannot find.**

1. Conversion Problem: (show work) (10 pts)

Convert 78.2 feet to meters. ( 12 inches = 1 foot, 2.54 cm = 1 inch)

2. For the element **P** (16 pts total)

a. What is the mass of one mole of the element ? \_\_\_\_\_ grams (4 pts)

b. How many grams does 82.2 moles weigh ? (show work.) (6 pts)

c. How many atoms do you have in that many moles ? (show work). (6 pts)

Name \_\_\_\_\_ (print) Name \_\_\_\_\_ (sign)

Please show work for partial credit and full credit on the Long Answers and in some of the Short Answer Questions. Multiple choice questions have no partial credit. Please write anything you want graded legibly. If I cannot read your work, I obviously cannot grade it. (2 pts print and sign exam) If you run out of space, please continue on the back page of the exam and clearly tell me where the remaining answer can be found.  $N_A = 6.022 \times 10^{23}$

**Part I MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**  
No partial credit for MC. (2 pts per question, 24 pts total)

- 1) A student performs an experiment to determine the density of a salt solution. She obtains the following results: 1.79 g/mL, 1.81 g/mL, 1.80 g/mL, 1.81 g/mL. If the actual value for the density of the salt solution is 1.80 g/mL, which statement below best describes her results? 1) \_\_\_\_\_  
A) Her results are accurate, but not precise.  
B) Her results are neither precise nor accurate.  
C) Her results are both precise and accurate  
D) Her results are precise, but not accurate.  
E) It isn't possible to determine with the information given.
- 2) Identify a solid. 2) \_\_\_\_\_  
A) no definite shape and no definite volume      B) definite volume and definite shape  
C) no definite shape and definite volume      D) definite volume and no definite shape
- 3) Which of the following are examples of extensive properties? 3) \_\_\_\_\_  
A) odor  
B) density  
C) color  
D) temperature  
E) mass
- 4) Identify the correct description of an atom. 4) \_\_\_\_\_  
A) protons and neutrons in nucleus; electrons in orbitals  
B) protons and electrons in nucleus; neutrons in orbitals  
C) neutrons in nucleus; protons and electrons in orbitals  
D) neutrons and electrons in nucleus; protons in orbitals  
E) electrons in nucleus; protons and neutrons in orbitals
- 5) Which of the following elements is a nonmetal? 5) \_\_\_\_\_  
A) Ni      B) Be      C) Br      D) K      E) Ce
- 6) Identify an anion. 6) \_\_\_\_\_  
A) An atom that has lost a neutron and a proton  
B) An atom that has gained a neutron.  
C) An atom that has lost an electron.  
D) An atom that has gained an electron.

- 7)  $\text{H}_2\text{O}$  is an example of \_\_\_\_\_  
A) a compound. B) a heterogeneous mixture.  
C) a homogeneous mixture. D) an element.
- 8) Predict the charge that an ion formed from Se would have. \_\_\_\_\_  
A) 1- B) 3- C) 6+ D) 2- E) 4+
- 9) Which of the following exists as a diatomic molecule? \_\_\_\_\_  
A) krypton  
B) lithium  
C) phosphorus  
D) carbon  
E) hydrogen
- 10) How many significant figures are in 0.00523980 mL? \_\_\_\_\_  
A) 5 B) 7 C) 6 D) 4 E) 3
- 11) A covalent bond is best described as \_\_\_\_\_  
A) the transfer of electrons.  
B) the sharing of electrons between atoms.  
C) a bond between two polyatomic ions.  
D) a bond between a metal and a nonmetal.  
E) a bond between a metal and a polyatomic ion.
- 12) In a chemical reaction, matter is neither created or destroyed. Which law does this refer to? \_\_\_\_\_  
A) Law of Definite Proportions  
B) Law of Modern Atomic Theory  
C) First Law of Thermodynamics  
D) Law of the Conservation of Mass  
E) Law of Multiple Proportions

**Part II Short Answer:** Write the word or phrase or circle the choice that best completes each statement or answers the question. Some questions may require that you show work. If you do not show work, you may lose points. Even on questions which do not require work, if you legibly show work, you may get some partial credit.

Please show all work on this exam itself. If you are going to show work on the scratch paper and want me to grade it, clearly indicate where I can find your work. (48 pts)

1. Circle the following which is an **element**. (not a Compound) (8 pts total, 2 pts each)

CO<sub>2</sub>      Fe      Sr Br<sub>2</sub>      O<sub>2</sub>

2. Fill in the blanks. (6 pts total, 3 pts each)

a. \_\_\_\_\_ mL = 1 liter      b. 1 meter = \_\_\_\_\_ cm

3. For the following symbols give the element name. For the following element name, write down the element symbol. (6 pts total, 3 pts each)

Zn \_\_\_\_\_      oxygen \_\_\_\_\_

4. Given the following block directly from the periodic table, (8 pts, 1 pt each)

Br

35
Br
79.904

- a. Write the symbol for the element in the form of  ${}^A_Z X$  \_\_\_\_\_
- b. How many protons? \_\_\_\_\_ c. How many electrons (for a neutral atom)? \_\_\_\_\_
- d. What is the charge on the element as an ion? \_\_\_\_\_ explain or show work.
- e. How many neutrons? \_\_\_\_\_ (show work)
- f. How many atoms does **one mole** of the element contain \_\_\_\_\_
- g. How much does **one atom** of the element weigh \_\_\_\_\_ amu
- h. How much does **one mole** of the element weigh \_\_\_\_\_ grams





**Part III. Long Answer Please show work for full credit and to receive partial credit. (26 pts)**

**\*\*\*\* Please attempt every problem for partial credit. You will get no partial credit if you just rewrite the question with no change in anything.\*\*\*\***

**Please show all work on this exam itself. If you are going to show work on the scratch paper and want me to grade it, clearly indicate where I can find your work otherwise, I obviously cannot grade work I cannot find.**

1. Conversion Problem: (show work) (10 pts)

Convert 13.78 milliliters to cups (1 Liter = 1.0567 quarts, 4 cups = 1 quart)

2. For the element S (16 pts total)

a. What is the mass of one mole of the element ? \_\_\_\_\_ grams (4 pts)

b. How many grams does 0.278 moles weigh ? show work. (6 pts)

c. How many atoms do you have in that many moles ? (show work). (6 pts)

Name \_\_\_\_\_ (print) Name \_\_\_\_\_ (sign)

Please show work for partial credit and full credit on the Long Answers and in some of the Short Answer Questions. Multiple choice questions have no partial credit. Please write anything you want graded legibly. If I cannot read your work, I obviously cannot grade it. (2 pts print and sign exam) If you run out of space, please continue on the back page of the exam and clearly tell me where the remaining answer can be found.  $N_A = 6.022 \times 10^{23}$

**Part I MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**  
No partial credit for MC. (2 pts per question, 24 pts total)

- 1) How many significant figures are in 0.00523980 mL? 1) \_\_\_\_\_  
A) 4 B) 6 C) 7 D) 5 E) 3
- 2) Identify the correct description of an atom. 2) \_\_\_\_\_  
A) protons and neutrons in nucleus; electrons in orbitals  
B) neutrons in nucleus; protons and electrons in orbitals  
C) electrons in nucleus; protons and neutrons in orbitals  
D) protons and electrons in nucleus; neutrons in orbitals  
E) neutrons and electrons in nucleus; protons in orbitals
- 3) A covalent bond is best described as 3) \_\_\_\_\_  
A) the transfer of electrons.  
B) a bond between two polyatomic ions.  
C) a bond between a metal and a polyatomic ion.  
D) the sharing of electrons between atoms.  
E) a bond between a metal and a nonmetal.
- 4) Which of the following are examples of extensive properties? 4) \_\_\_\_\_  
A) color  
B) density  
C) temperature  
D) mass  
E) odor
- 5) Predict the charge that an ion formed from Se would have. 5) \_\_\_\_\_  
A) 3- B) 2- C) 4+ D) 1- E) 6+
- 6) In a chemical reaction, matter is neither created or destroyed. Which law does this refer to? 6) \_\_\_\_\_  
A) Law of Definite Proportions  
B) Law of Multiple Proportions  
C) Law of Modern Atomic Theory  
D) Law of the Conservation of Mass  
E) First Law of Thermodynamics
- 7) Which of the following elements is a nonmetal? 7) \_\_\_\_\_  
A) Ni B) K C) Br D) Be E) Ce

- 8) Identify an anion. 8) \_\_\_\_\_  
A) An atom that has lost a neutron and a proton.  
B) An atom that has gained an electron.  
C) An atom that has lost an electron.  
D) An atom that has gained a neutron.
- 9) H<sub>2</sub>O is an example of 9) \_\_\_\_\_  
A) a homogeneous mixture. B) a compound.  
C) an element. D) a heterogeneous mixture.
- 10) Which of the following exists as a diatomic molecule? 10) \_\_\_\_\_  
A) phosphorus  
B) carbon  
C) lithium  
D) krypton  
E) hydrogen
- 11) Identify a solid. 11) \_\_\_\_\_  
A) definite volume and definite shape B) no definite shape and definite volume  
C) definite volume and no definite shape D) no definite shape and no definite volume
- 12) A student performs an experiment to determine the density of a salt solution. She obtains the following results: 1.79 g/mL, 1.81 g/mL, 1.80 g/mL, 1.81 g/mL. If the actual value for the density of the salt solution is 1.80 g/mL, which statement below best describes her results? 12) \_\_\_\_\_  
A) Her results are precise, but not accurate.  
B) Her results are neither precise nor accurate.  
C) Her results are both precise and accurate  
D) Her results are accurate, but not precise.  
E) It isn't possible to determine with the information given.

**Part II Short Answer:** Write the word or phrase or circle the choice that best completes each statement or answers the question. Some questions may require that you show work. If you do not show work, you may lose points. Even on questions which do not require work, if you legibly show work, you may get some partial credit.

Please show all work on this exam itself. If you are going to show work on the scratch paper and want me to grade it, clearly indicate where I can find your work. (48 pts)

1. Circle the following which is a **Compound** (not element) (8 pts total, 2 pts each)

CO<sub>2</sub>      Fe      Sr Br<sub>2</sub>      O<sub>2</sub>

2. Fill in the blanks. (6 pts total, 3 pts each)

a. 1 kilogram = \_\_\_\_\_ grams      b. 1 km = \_\_\_\_\_ meters

3. For the following symbols give the element name. For the following element name, write down the element symbol. (6 pts total, 3 pts each)

Pt \_\_\_\_\_      carbon \_\_\_\_\_

4. Given the following block directly from the periodic table, (8 pts, 1 pt each)

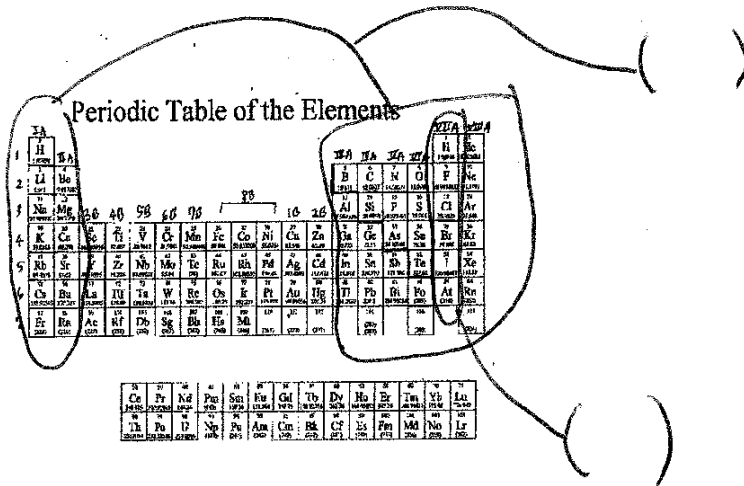
Be

4
Be
9.012182

- a. Write the symbol for the element in the form of  ${}^A_Z X$  \_\_\_\_\_
- b. How many protons? \_\_\_\_\_      c. How many electrons (for a neutral atom)? \_\_\_\_\_
- d. What is the charge on the element as an ion? \_\_\_\_\_ explain or show work.
- e. How many neutrons? \_\_\_\_\_ (show work)
- f. How many atoms does **one mole** of the element contain \_\_\_\_\_
- g. How much does **one atom** of the element weigh \_\_\_\_\_ amu
- h. How much does **one mole** of the element weigh \_\_\_\_\_ grams

7 Match the following to the letters shown. The letters may only be used one time or not at all. (4 pts each, 8 pts total)

- (a) transition metal elements (b) lanthanide, actinide elements (c) main group elements (d) alkali metal elements (e) alkaline earth elements (f) halogens (g) noble gases



8 Given the following list of chemical formulas, circle all which are **covalent** (1 pt each, 6 pts total)

- CaCl<sub>2</sub>      CO<sub>2</sub>      Sr<sub>3</sub>N<sub>2</sub>      PCl<sub>3</sub>      BaF<sub>2</sub>      F<sub>2</sub>

9 Give the correct formula for the following elements. The ion charges are given together with the element symbol. (show work) (6 pts) K(+1) N(-3)

**Part III. Long Answer Please show work for full credit and to receive partial credit. (26 pts)**

**\*\*\*\* Please attempt every problem for partial credit. You will get no partial credit if you just rewrite the question with no change in anything.\*\*\*\***

**Please show all work on this exam itself. If you are going to show work on the scratch paper and want me to grade it, clearly indicate where I can find your work otherwise, I obviously cannot grade work I cannot find.**

1. Conversion Problem: (show work) (10 pts)

Convert 13.78 kilograms to ounces (453.59 grams = 1 pound, 16 ounces = 1 pound)

2. For the element **Se** (16 pts total)

a. What is the mass of one mole of the element ? \_\_\_\_\_ grams (4 pts)

b. How many grams does 0.0672 moles weigh ? (show work.) (6 pts)

c. How many atoms do you have in that many moles ? (show work). (6 pts)