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## *Answer Sheet*

| No | Part I: Multiple Choices | | |
|---|---|---|---|
| 1. | A | 9. | A |
| 2. | C | 10. | C |
| 3. | A | 11. | B |
| 4. | B | 12. | C |
| 5. | C | 13. | C |
| 6. | B | 14. | C |
| 7. | A | 15. | A |
| 8. | D | | |

**Part II: Short answer (10%)**

Directions: Write your final answer in the space provided for each questions.

1. When a patient is ill, his or her temperature may increase to 104°F. Calculate the temperature of this patient in: (2 pt)

a. Celsius units

b. kelvin units

a) $°C = \frac{5}{9}(°F - 32) = \frac{5}{9}(104°F - 32) = \frac{5}{9}(72) = \frac{360}{9} = 40°C$

b) $K = °C + 273.15$

$= 40°C + 273.15$

$= 313.15 K$

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3. Analysis of a sample of the gas showed that it consisted of 91.84% $^{20}Ne$ (mass 19.9924 amu), 0.47% $^{21}Ne$ (mass 20.9940 amu), and 7.69% $^{22}Ne$ (mass 21.9914 amu). What is the average mass of the neon? (3pt)

Average mass $= A_1 F_1 + A_2 F_2 + A_3 F_3$

$= 19.9924 amu \times \frac{91.84}{100} + 20.9940 amu \times \frac{0.47}{100} + 21.9914 amu \times \frac{7.69}{100}$

$= 19.9924 amu \times 0.9184 + 20.9940 amu \times 0.0047 + 21.9914 amu \times 0.0769$

$= 18.36 amu + 0.099 amu + 1.6910 amu$

$= 20.15 amu$

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HAWASSA UNIVERSITY
COLLEGE OF NATURAL AND COMPUTATIONAL SCIENCE
DEPARTMENT OF CHEMISTRY

**Mid exam on General chemistry for 1st Year Students,**

**Academic Year, 2015E.C**

**Exam Date (4/05/2015 E.C)**

***General Instructions***

- ✓ Switch of your mobile phone before starting the exam
- ✓ Write your name, ID number and department on a given blank space.
- ✓ Attempt to cheating is strictly forbidden and will result zero mark.

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Load: 25%

***Time allowed: 90 minutes***

Name of [redacted]

Department [redacted]

Part I: ***Choose the correct answer from the given alternatives for the following questions and write the letter of the correct choice on the answer sheet (1 pt. each).***

1. Air has a density of 0.0013 g/ml. What is the mass of a 6.0-L sample of air?

A. 7.8 g B.7.9 g C. 5.4 g D. 2.3 g

2. A gaseous state of matter that contains appreciable numbers of electrically charged is called_____

A. Solid B. Liquid C. Plasma D. Gas

3. Which of the following is an example of extensive property?

A. Gibbs energy B. Potential C. Viscosity D. Density

4. The number of electron in $^{63}_{29}Cu^{+2}$ is _____

A. 29 B. 27 C. 31 D. 25

5. Which of the following statements are ***incorrect*** about physical property of ionic compounds?

A. They have high melting and boiling points.

B. They have high density.

C. In solid form, an ionic compound is electrically conductive.

D. They are hard and brittle.

6. What is the correct chemical formula of Cobalt (II) bromide?

A. CuBr B. $CoBr_2$ C. $Co_2Br$ D. $CuBr_2$

7. How many moles of hydrochloric acid react with excess aluminum to form 6moles of hydrogen? $2Al + 6HCl \longrightarrow 2AlCl_3 + 3H_2$

A. 12 mole B. 6 mole C. 8 mole D. 10 mole

8. When 32.5 g of zinc reacted with excess hydrochloric acid; 0.8 g of hydrogen gas was formed, what was the percentage yield of hydrogen? $Zn + 2HCl \rightarrow ZnCl_2 + H_2$ (Zn= 65g/m)

A. 50% B. 65% C. 70% D. 80%

9. Copper is commonly used to fabricate electrical wire. How many copper atoms are in 5.00 g of copper wire? (Cu= 63 g/m)

A. $0.47\times10^{23}$ B. $0.13\times10^{23}$ C. $0.9\times10^{-23}$ D. $0.47\times10^{23}$

10. From a given alternatives which one is *correct* statement?

$Cl_2(aq) + 2KI(aq) \longrightarrow 2KCl(aq) + I_2(aq)$

A. K is reducing agent B. $I_2$ is reduced C. $Cl_2$ is oxidized agent D. $I_2$ is oxidized agent

11. Which statement is ***incorrect*** about the percent composition by mass in $C_2H_6O$?

A. Carbon is 52.17% B. Hydrogen is 17% C. Oxygen is 34.78% D. Hydrogen is 13.04%

12. If 1.2 L of a 5.00 M solution of copper nitrate, $Cu(NO_3)_2$, is diluted to a volume of 2.4 L by the addition of water, what is the molarity of the diluted solution?

A. 2.36 M B. 2.9 M C. 2.5 M D. 4.5 M

13. Which molecule is weak acid?

A. HCl B. $H_2SO_4$ C. $CH_3COOH$ D. $HNO_3$

14. 1.6 g of Al and 1.8 g of $Cl_2$ were mixed and made to react according to the following reaction

$2Al + 3Cl_2 \longrightarrow 2AlCl_3$ (Al= 27 g/m, Cl=35.5 g/m)

The limiting reactant is _____

A. Al B. $AlCl_3$ C. $Cl_2$ D. All

15. 0.0521 + 0.236 = _____

A. $2.38\times10^{-1}$ B. $2.99\times10^{-1}$ C. 0.0032 D. 0.0028

3. Distinguish between a pure substance and a mixture.(2 pt)

(i) pure substance - is a substance that have constant composition
- pure substance is divided into element & compound.
- element is the pure substance that is not break down into simpler form by chemical process.
- compound is also pure substance that is break down into simpler form by chemical process.

(ii) mixture - is ~~substance~~ a matter that do not have constant composition.
- mixture is divided into two Homogenous & Heterogenous
- Homogenous mixture is uniform through out, also called solution
- Heterogeneous mixture is not uniform through out seen by our naked eye.

4. Write balanced molecular equations, complete ionic and net ionic equations for the following:(3pt)

A. $KCl\ (aq) + Pb(NO_3)_2\ (aq) \longrightarrow KNO_3(aq) + PbCl_2(s)$

Molecular equation

$2KCl_{(aq)} + Pb(NO_3)_{2(aq)} \longrightarrow 2KNO_{3(aq)} + PbCl_{2(s)}$

Complete ionic equation

$2K^+_{(aq)} + 2Cl^-_{(aq)} + Pb^{2+}_{(aq)} + 2NO_3^-{}_{(aq)} \rightarrow 2K^+_{(aq)} + 2NO_3^-{}_{(aq)} + PbCl_2$

Net ionic equation

$2Cl^-_{(aq)} + Pb^{2+}_{(aq)} \rightarrow PbCl_{2(s)}$