Chem 51, Spring 2016 NAME KEY

Exam 1 (Chapter 1) 75 pt

Answer Questions 1-24 on your scantron. Each question is worth (2 pt ea). Some question require marking more than one answer.

1.1 Classification of Matter

Use the following to answer Questions 1-4

A) pure substance B) mixture. C) homogeneous. D) heterogeneous E) compund DE) element

How would you classify…(*Mark all answers that apply*)

1. Coins in a piggy bank. B D
2. Salt water. B C
3. Iron. DE C A
4. H_2O A C E

1.2 Elements, Compounds and the Periodic Table

5. Which of the following elements is an alkali metal?
   A) nitrogen B) fluorine C) argon D) strontium E) potassium

6. The Group 8A(18) elements
   A) are unreactive and are rarely found in combination with other elements.
   B) are good conductors of electricity.
   C) melt at high temperatures.
   D) are liquids at room temperature.
   E) react vigorously with water.

7. Which of the following properties is NOT a characteristic of metallic elements?
   A) They are shiny.
   B) They are good conductors of heat.
   C) They react vigorously with water.
   D) Most of them are liquids at room temperature. } either
   E) They are good conductors of electricity.

8. What elements are in hydroxyapatite, $Ca_5(PO_4)_3OH$, a major compound in human bones and teeth?
   A) carbon, potassium, oxygen, hydrogen 1
   B) calcium, phosphorous, oxygen, hydrogen 2
   C) carbon, phosphorous, oxygen, helium 1
   D) calcium, phosphorous, oxygen, helium 1.5
   E) carbon, potassium, oxygen, helium .5

9. The most abundant element on the earth surface is
   A) hydrogen B) helium C) oxygen D) silicon E) aluminum

(8 pt) Match the following element names with their symbols or symbols with names, whichever is missing.

Barium	Ba	Silver	Ag
beryllium	Be	Gold	Au
Uranium	U	Vanadium	V
Iodine	I	silicon	Si

BONUS (2 pt) What is another name for a pyromaniac? Arsenic *Look on the periodic table for an element name that will fill the blank.*

27 pt

1.3 Math Counts

10. Mark your scantron for each one that is correct. *Mark all that apply.*

A) 1 microsecond = 10^6 s B) 1000 L = 1 mL C) 1 cm = 0.01 m D) 1000 km = 1 m

11. Which statement contains an exact number?

A) A gross of paper contains 144 sheets.
B) One sheet of paper is 0.0042 inches thick.
C) One sheet of paper measures 8.5 × 11 inches.
D) A ream of medium weight paper weighs 20 pounds

12. Which measurement is consistent with a graduated cylinder which has an uncertainty of ±0.1 mL?

A) 21.14 mL B) 21 mL C) 21.1 mL D) 21.140 mL E) 21.1400 mL

13. Perform the following mathematical operations. Express your answer to the proper number of significant figures.

(93.789 - 5.40) × 18.057 =

A) 1600 B) 1590 C) 1596.2 D) 1596 E) 1596.239

14. How is this (105,006) written in correct scientific (exponential) notation?

A) 1.0×10^5 B) 1.05006×10^5 C) 1.1×10^5 D) 1.05×10^5

15. What is the percent by mass of salt in a mixture that contains 1.2 g of flour, 150 g of salt, and 650 g of sugar?

A) 8.1% B) 7.5% C) 19% D) 0.075%

1.2
150
650
801.2

$\frac{150}{801.2} \times 100 =$

1.4 Matter: The "Stuff" of Chemistry

16. Which of the following is/are characteristics of gases?

A) high compressibility
B) relatively long distances between molecules
C) formation of homogeneous mixtures regardless of the natures of non-reacting gas components
D) all of the above
E) none of the above

17. Which of the following statements bests describes the particles (atoms or molecules) in a liquid?

A) They are close together and in a fixed arrangement.
B) They are far apart and randomly arranged.
C) They are close together and randomly arranged.
D) They are far apart and in a fixed arrangement.

1.5 Measuring Matter

(10 pt) The doctor orders a drug to be administered once a day at 15 mg per kg body weight. The drug is supplied as 25 mg per 1.0 cc. The patient is a child and weighs 5.5 lb. How many mL of drug should be given?

$? \text{ mL} = 5.5 \text{ lb} \times \frac{1 \text{ kg}}{2.2046 \text{ lb}} \times \frac{15 \text{ mg}}{1 \text{ kg}} \times \frac{1.0 \text{ cc}}{25 \text{ mg}} \times \frac{1 \text{ mL}}{1 \text{ cc}}$

$= \frac{5.5 \times 15}{2.2046 \times 25} = \boxed{1.5 \text{ mL}}$

26 pt

18. Which of the following is a mass unit?
A) cg B) mL C) dm D) yd

19. Which of the following is the correct unit for length?
A) cg B) mL C) dm D) gal

(6 pt) Express the following quantity of energy, 74.6 joules, in cal and Cal.

$74.6\,J \times \frac{1\,cal}{4.184\,J} = 17.8\,cal$

$17.8\,cal \times \frac{1\,Cal}{1000\,cal} = 0.0178\,Cal$

1.6 How Matter Changes

In the following reaction $Mg(s) + Cl_2 \rightarrow MgCl_2$ how would you classify each substance according to answers A-E (*mark all that apply*)

A) Mixture B) Element C) Compound D) Homogeneous E) Heterogeneous

20. $Cl_2(g)$ C D

21. $MgCl_2(s)$ C D

22. $Mg(s)$ B D

(3 pt) Balance the following chemical equation:

2 H_2 + 1 O_2 → 2 H_2O

23. Which of the following is not a *physical change*?
A) Boiling water
B) Dissolving kool-aid
C) Frying an egg
D) Liquefying oxygen

24. An example of a chemical reaction is:
A) TNT is explosive
B) Gasoline is flammable
C) Zinc reacts with hydrochloric acid to produce hydrogen gas
D) All the above

23 pt