CH 151 Midterm Exam Cover Sheet

Sample Exam

Name: _____

This sample exam consists of four (4) double-sided pages (including this sheet) with twenty-five (25) multiple choice questions, six (6) short answer questions, and one (1) five point extra credit question.

Point values are summarized on the next page.

A periodic table and scratch paper are available for you to use on this exam.

Before you start:

- Verify that you have all four (4) double-sided pages
- Write your name in the space above

At the conclusion of the exam:

- Sign the integrity statement below. **Failing to sign the integrity statement on this exam imparts an immediate grade of zero.**
- Ensure that all multiple choice answers are clearly marked
- Turn in the exam, the periodic table and all scratch paper used

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Integrity statement:

I have neither given nor received aid on this exam.

_____

Your signature

CH 151 Midterm Exam Point Distribution Sheet

Sample Exam

Multiple choice questions:

_____ X *4 points per question* = _____ points

number of multiple choice questions correct

Short answer questions and extra credit:

_____ points

Total points on this exam: _____ points

Grade	***Percentage***	***Points on This Exam***
A	90% - 100%	117 - 130
B	80% - 89%	104 - 116
C	65% - 79%	84 - 103
D	50% - 64%	65 - 83
F	0% - 49%	0 - 64

CH 151 Sample Midterm Exam Name: _____ _

Part I: Multiple Choice Questions (100 Points) There is *only* one best answer for each question.

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1. There are _____ ng in a pg. ($n = 10^{-9}$, $p = 10^{-12}$)

   a. 0.001
   b. 1000
   c. 0.01
   d. 100
   e. 10

2. Express the temperature 422.35 K in degrees Celsius.

   a. 792.23 °C
   b. 149.20 °C
   c. 692.50 °C
   d. 50.89 °C
   e. 22.78 °C

3. Which group in the periodic table contains only nonmetals?

   a. IA
   b. IIA
   c. VA
   d. VIIB
   e. VIIIA

4. The recommended adult dose of Elixophyllin®, a drug used to treat asthma, is 6.00 mg/kg of body mass. Calculate the dose in milligrams for a 115-lb person. 1 lb = 453.59 g.

   a. 24
   b. 1,521
   c. 1.5
   d. 313
   e. 3.1×10^5

5. Convert $5.01*10^3$ cm to km, m and mm

   a. $5.01*10^{-2}$ km, $5.01*10^1$ m, $5.01*10^4$ mm
   b. $5.01*10^{-2}$ km, $5.01*10^1$ m, $5.01*10^3$ mm
   c. $5.01*10^{-2}$ km, $5.01*10^5$ m, $5.01*10^8$ mm
   d. $5.01*10^4$ km, $5.01*10^1$ m, $5.01*10^{-2}$ mm
   e. $5.01*10^8$ km, $5.01*10^5$ m, $5.01*10^2$ mm

6. Which of the numbers has the *most* significant figures?

   a. $32{,}769{,}100*10^{-6}$ pg
   b. $12.19*10^{-3}$ g
   c. 9,241,000 J
   d. 0.00163 s
   e. 1,200,000.00 kWh

7. Elements in Group 7A are known as the

   a. alkali metals
   b. chalcogens
   c. alkaline earth metals
   d. halogens
   e. noble gases

8. Calcium forms an ion with a charge of

   a. +2
   b. +1
   c. -1
   d. -2
   e. unknown; it is a variable charge metal

9. Which of the following is a chemical property?

   a. Combustibility
   b. Boiling Point
   c. Density
   d. Melting Point
   e. Index of refraction

10. Which of the following is *true*?

    a. Two objects, both having positive charges, repel each other
    b. Two objects having opposite charges attract each other
    c. Electrostatic forces are responsible for the energy absorbed or released in chemical changes
    d. The number of neutrons in an atom of an element is variable and depends on the isotope
    e. All of the above are true

11. Which of the following symbol/name pairs are correctly matched?

    a. Fl, Fluorine
    b. Ca, Carbon
    c. S, Silicon
    d. Ir, Iron
    e. Na, Sodium

12. Isobars of an element have similar

    a. protons
    b. neutrons
    c. electrons
    d. atomic numbers
    e. mass numbers

13. Which of the following masses is closest to the mass of one atomic mass unit (amu)?

    a. 12 g
    b. 1.66 g
    c. 1 g
    d. $^{1}/_{12}$ g
    e. 10^{-24} g

14. Which of the following is correct for the third period element in Group 4A?

	Z	Chemical Symbol	Atomic Mass
a.	31	Ga	69.72
b.	69.72	Ga	31
c.	14	Si	28.09
d.	28.09	Si	14
e.	21	Sc	44.96

15. Which of the following is correct?

a. The element H is in both the first period and the seventh period
b. The element Na is in Group 2A
c. The element Ge is in the fourth period and Group 4A
d. The element Cr is in the third period and Group 6B
e. More than one of the statements above are correct

16. Which of the following name/formula pairs is correct?

a. phosphoric acid, H_3PO_3
b. sulfate ion, SO_3^{2-}
c. bromate ion, BrO_3^{-1}
d. hydrochlorous acid, HCl
e. carbonate ion, CO_3^{-1}

17. What is the name of $Cu(ClO_3)_2 \cdot 2\ H_2O$?

a. copper chlorate terthydrate
b. copper(II) chlorate dihydrate
c. copper chlorate terhydrate
d. copper(II) chlorate terhydrate
e. copper chlorate trihydrate

18. Which of the following is the correct name for the ammonium ion?

a. NH_4
b. NH_4^+
c. NH_3^+
d. NH_3
e. NH_2^{-1}

19. What are the formulas of the compounds calcium periodate and potassium nitrate?

a. $Ca(IO_4)_2$, KNO_2
b. $Ca(IO_3)_2$, KNO_2
c. $Ca(IO_4)_2$, KNO_3
d. $Ca(IO_3)_2$, KNO_3
e. $CaIO_4$, KNO_3

20. Identify the element below which does *not* form stable diatomic molecules:

a. nitrogen
b. hydrogen
c. chlorine
d. bromine
e. carbon

21. How many molecules are in 0.105 mol of N_2H_4?

    a. $6.32*10^{22}$
    b. $5.73*10^{2\backslash 4}$
    c. $1.74*10^{-25}$
    d. $1.58*10^{-23}$
    e. 1.79

22. Calculate the molar mass of gallium carbonate

    a. 129.7 g/mol
    b. 154.3 g/mol
    c. 189.7 g/mol
    d. 319.5 g/mol
    e. 334.6 g/mol

23. Calculate the percent composition of gallium selenide.

    a. 37.1% Ga, 62.9% Se
    b. 42.3% Ga, 57.7% Se
    c. 44.1% Ga, 55.9% Se
    d. 46.7% Ga, 53.3% Se
    e. 50.0% Ga, 50.0% Se

24. From the following, pick the compound that could be an empirical formula:

    a. C_4H_8
    b. NH_3
    c. Al_2Br_6
    d. N_2O_4
    e. more than one of the above could be an empirical formula

25. How many grams of oxygen are in 8.50 g of potassium sulfite, K_2SO_3?

    a. 2.12 g
    b. 2.58 g
    c. 4.25 g
    d. 4.53 g
    e. 16.0 g

Part II: Short Answer / Calculation, 30 points total. *Show all work!*

1. A new compound called Chemane is composed of 40.00% C, 6.72% H, and the remainder oxygen. Calculate the empirical formula of Chemane. (8 points)

2. If the molar mass of Chemane in problem #1, above, is found to be 180.18 g/mol, calculate the molecular formula of Chemane. (6 points)

3. Provide the appropriate chemical formula or name to the following. Use acid names if appropriate. (1 point each)

   phosphorus tribromide

   SCl_4

   sodium iodate

   $Fe(ClO_2)_5$

   calcium iodide

   chromium(III) nitrate

   $(NH_4)_2SO_4$

   potassium phosphide

   $HNO_3(aq)$

   $Ca(OH)_2$

4. Find the mass of 115.7 cm^3 benzene in pounds. (density = 0.779 g/mL, 454 g = 1 pound) (4 points)

5. What is the **formula** and **molar mass** of calcium nitrate? (4 points)

6. Convert 4.2 K to °C and °F. (3 points)