

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. You will need to use a scantron (purchased from the MHCC bookstore) with fifty questions on each side for the multiple-choice section of the exam.

Before you start:

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

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 in the appropriate box on the scantron
- Turn in the exam, the scantron, the periodic table and all scratch paper used

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

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

- There are _____ ng in a pg. ($n = 10^{-9}$, $p = 10^{-12}$)
 - 0.001
 - 1000
 - 0.01
 - 100
 - 10
- Express the temperature 422.35 K in degrees Celsius.
 - 792.23 °C
 - 149.20 °C
 - 692.50 °C
 - 50.89 °C
 - 22.78 °C
- Which group in the periodic table contains only nonmetals?
 - IA
 - IIA
 - VA
 - VIIIB
 - VIIIA
- 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.
 - 24
 - 1,521
 - 1.5
 - 313
 - 3.1×10^5
- Convert 5.01×10^3 cm to km, m and mm
 - 5.01×10^{-2} km, 5.01×10^1 m, 5.01×10^4 mm
 - 5.01×10^{-2} km, 5.01×10^1 m, 5.01×10^3 mm
 - 5.01×10^{-2} km, 5.01×10^5 m, 5.01×10^8 mm
 - 5.01×10^4 km, 5.01×10^1 m, 5.01×10^{-2} mm
 - 5.01×10^8 km, 5.01×10^5 m, 5.01×10^2 mm
- Which of the numbers has the *most* significant figures?
 - $32,769,100 \times 10^{-6}$ pg
 - 12.19×10^{-3} g
 - 9,241,000 J
 - 0.00163 s
 - 1,200,000.00 kWh

7. Elements in Group 7A are known as the
- alkali metals
 - chalcogens
 - alkaline earth metals
 - halogens
 - noble gases
8. Calcium forms an ion with a charge of
- +2
 - +1
 - 1
 - 2
 - unknown; it is a variable charge metal
9. Which of the following is a chemical property?
- Combustibility
 - Boiling Point
 - Density
 - Melting Point
 - Index of refraction
10. Which of the following is *true*?
- Two objects, both having positive charge, repel each other
 - Two objects having like charges attract each other
 - Electrostatic forces are responsible for the energy absorbed or released in chemical changes
 - The number of neutrons in an atom of an element is constant and does not change
 - All of the above are true
11. Which of the following symbol/name pairs are correctly matched?
- Fl, Fluorine
 - Ca, Carbon
 - S, Silicon
 - Ir, Iron
 - Na, Sodium
12. Isobars of an element have similar
- protons
 - neutrons
 - electrons
 - atomic numbers
 - mass numbers
13. Which of the following masses is closest to the mass of one atomic mass unit (amu)?
- 12 g
 - 1.66 g
 - 1 g
 - $\frac{1}{12}$ g
 - 10^{-24} g

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

<u>Z</u>	<u>Chemical Symbol</u>	<u>Atomic Mass</u>
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?

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

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

- phosphoric acid, H_3PO_3
- sulfate ion, SO_3^{2-}
- bromate ion, BrO_3^{-1}
- hydrochlorous acid, HCl
- carbonate ion, CO_3^{-1}

17. What is the name of $\text{Cu}(\text{ClO}_3)_2 \cdot 2 \text{H}_2\text{O}$?

- copper chlorate terhydrate
- copper(II) chlorate dihydrate
- copper chlorate terhydrate
- copper(II) chlorate terhydrate
- copper chlorate trihydrate

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

- NH_4
- NH_4^+
- NH_3^+
- NH_3
- NH_2^{-1}

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

- $\text{Ca}(\text{IO}_4)_2$, KNO_2
- $\text{Ca}(\text{IO}_3)_2$, KNO_2
- $\text{Ca}(\text{IO}_4)_2$, KNO_3
- $\text{Ca}(\text{IO}_3)_2$, KNO_3
- CaIO_4 , KNO_3

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

- nitrogen
- hydrogen
- chlorine
- bromine
- carbon

21. How many molecules are in 0.105 mol of N_2H_4 ?
- 6.32×10^{22}
 - 5.73×10^{24}
 - 1.74×10^{-25}
 - 1.58×10^{-23}
 - 1.79
22. Calculate the molar mass of gallium carbonate
- 129.7 g/mol
 - 154.3 g/mol
 - 189.7 g/mol
 - 319.5 g/mol
 - 334.6 g/mol
23. Calculate the percent composition of gallium selenide.
- 37.1% Ga, 62.9% Se
 - 42.3% Ga, 57.7% Se
 - 44.1% Ga, 55.9% Se
 - 46.7% Ga, 53.3% Se
 - 50.0% Ga, 50.0% Se
24. From the following, pick the compound that could be an empirical formula:
- C_4H_8
 - NH_3
 - Al_2Br_6
 - N_2O_4
 - 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 ?
- 2.12 g
 - 2.58 g
 - 4.25 g
 - 4.53 g
 - 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
 - $\text{Fe}(\text{ClO}_2)_5$
 - calcium iodide
 - chromium(III) nitrate
 - $(\text{NH}_4)_2\text{SO}_4$
 - potassium phosphide
 - $\text{HNO}_3(\text{aq})$
 - $\text{Ca}(\text{OH})_2$

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

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

6. Convert 4.2 K to $^{\circ}\text{C}$ and $^{\circ}\text{F}$. (3 points)