

*** ALWAYS ANSWER IN FULL SENTENCES!

*** On numerical problems, you **MUST** show your set ups. When dimensional analysis is specified, you **MUST** set up the problem by dimensional analysis.

*** Use your time wisely. Do not get stuck on one question.

*** Answer each question carefully, with thought and with confidence! Do not stop to check over your work until you have worked through the entire exam.

PAGE	TOTAL SCORE POSSIBLE	YOUR SCORE
1	33	
2	19	
3	20	
4	24	
5	4	
TOTAL	100	
Bonus p.5	10	

Adjusted total to Exam I =

Current Course Total =

LENGTH	MASS	VOLUME
1 in = 2.54 cm (exactly)	1 lb = 454 g	1 qt = 0.946 L
1 mi = 5280 ft (exactly)	1 ton = 2000 lb (exactly)	1 qt = 2 pt 1 gal = 4 qt

1. (12 pts) Give the formula or name as indicated below:
HINT: Think carefully about which ones require Roman numerals!

<u>Formula</u>	<u>NAME</u> (Watch your spelling!)	<u>Formula</u>	<u>NAME</u>
Sn ²⁺	_____	_____	sodium oxide
Cu ₂ O	_____	_____	iron(II) bromide
PbS ₂	_____	_____	calcium nitride

2. (8 pt) Give the formula ***and*** physical states for the following elements:
Follow the example shown for the first one.

<u>Name</u>	<u>Formula & Physical State</u>
hydrogen	H ₂ (g)
mercury	_____
phosphorus	_____
xenon	_____
iodine	_____

3. (3 pts) How many significant figures are in each of the following numbers?

- a) 2000 Ans. _____
b) 0.0038 Ans. _____
c) 1.020 x 10³ Ans. _____

4. (2 pts) Which of the following numbers need ***not*** be in scientific notation? Circle **all** that applies.

- a) 0.213 b) 3.1x10 c) 150 d) 45

5. (4 pts) Round the following numbers to the designated number of sig. fig.

Use scientific notation only when appropriate!

- a) 0.135 to 2 sig. fig. = _____ b) 78100 to 2 sig. fig. = _____

6. (4 pts) Express the following in scientific notation:

- a) 137.2 x 10⁻⁵ = _____ b) 0.002 x 10⁷ = _____

7. (6 pts) Give your answer in the correct number of sig. fig. Use scientific notation only when appropriate. You may use your calculator if you wish but remember that your calculator does NOT figure out sig. fig.!!

A. $48.32 - 48.31 =$

Ans. _____

B. $\frac{7.5 + 5.3}{7.83} =$

Ans. _____

C. $\frac{4.64 \times 10^{-39}}{39.86 \times 10^{42} \times 21.6 \times 10^{-28}}$

Ans. _____

8. (2 pts) Do the following calculations. Treat all the numbers as being “exact”.

$8 - 5 \times 3 + 7(5 + 3) \div 2 =$

Ans. _____

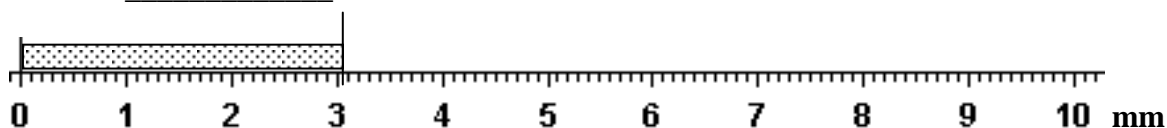
9. (2 pts) Solve for the unknown X. Show your work clearly. Write your answer in the box.

$$\frac{3}{X} = \frac{B}{A}$$

X =

10. (2 pts) Record the length of the object above the ruler to the correct significant figures.

Ans. _____



11. (4 pts) Give the definition of each of the following by completing the sentence. Do not give examples.

Matter is...

Chemistry is...

12. (3 pts) Name three of the fractions obtained from the fractional distillation of crude oil.

13. (12 pts) **Using dimensional analysis AS SHOWN IN LECTURE**, perform the following conversions. Be sure to give your answers to the correct sig. fig.. No credit will be given if the dimensional analysis set up is not shown! **Use scientific notation in your answer only if necessary.**

A. Convert 0.372 cm to nanometer

Ans. _____

B. What is 12.7 ft² in km²?

Ans. _____

C. A solution has a density of 1.73 g/mL. If it weighs 4.3 ounces, what is its volume?

Ans. _____

14. (4 pts) Put a check mark ✓ if the substance belongs in this group.

Put a cross mark X if the substance does NOT belong in this group.

	atom	molecule	element	compound	ionic compound
KF					
Hf					
HF					
H ₂					

Be sure every spot in the table above has either a check mark ✓ or an X

15. (4 pts) Convert 87.3°F to degrees Celsius. Show your work clearly and watch your sig. fig.

$$F = 1.8C + 32 \quad (1.8 \text{ and } 32 \text{ are exact numbers})$$

Ans. _____

16. (4 pts) What is the name of the process of a liquid changing to its gaseous state? Ans. _____

What is the name of the process of a solid changing to its gaseous state without melting? Ans. _____

17. (2 pts) Which of the following is a unit of density?

CIRCLE ALL THAT APPLIES. There may be more than one answer.

- A. g B. cm^3 C. mL/g D. pounds/gallon E. g/L

(2 pts each) Multiple Choice: **Circle ONE** letter corresponding to the best answer in each case.

18. Which of the following corresponds to $\text{cm} \cdot \frac{1}{\text{g/cm}}$?

- A. g B. cm^2/g C. g/cm^2 D. none of the above

19. Which of the following is halogen?

- A. K B. Ca C. Co D. As E. P F. Br

20. Which of the following is an ionic compound?

- A. HgBr_2 B. NO_2 C. Na D. Cu^{2+} E. None of the above.

21. Brass is...

- A. an element B. a compound C. a heterogeneous mixture D. homogeneous mixture E. None of the above

22. Which of the following describes a chemical property?

- A. Hydrogen gas is flammable.
B. Table salt is soluble in water.
C. Zinc melts at 420°C .
D. None of the above.

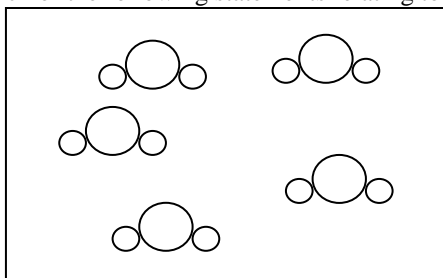
23. The process of water boiling is an...

- A. endothermic reaction. B. exothermic reaction.

24. Density is an...

- A. extensive property B. intensive property

25. Which of the following statements relating to the diagram below is correct?



- A. The diagram illustrates a pure substance.
B. The diagram illustrates an element.
C. The diagram illustrates a mixture of two elements.
D. The diagram illustrates a mixture of an element and a compound.
E. The diagram illustrates a mixture of two compounds.

26. Which is the correct order of the steps in the scientific method as presented in the lecture?

- A. theory test hypothesis observation
B. hypothesis test observation theory
C. observation hypothesis test theory
D. theory test observation hypothesis

27. Which of the following does not belong in the Kinetic Molecular Theory of Gases?
- A. Gas molecules are widely spaced.
 - B. The actual volume of molecules is negligible compared to the space they occupy.
 - C. Gases are compressible.
 - D. Molecules collide with each other and with the container walls without loss of total kinetic energy.
28. When two gases mix in a container, the heavier gas exerts a higher pressure at the top of the container.
- A. True
 - B. False

BONUS POINTS

(1 pt) *Make sure you have your full name on both sides of every page!!!*

(1 pt) Convert 6.8 cm^3 to milliliters.

Ans. _____

(8 pts) Give the formulas and names of the "Basic Eight" common polyatomic ions.
Remember that formulas of ions **MUST** have the correct charges.

FORMULA	NAME	FORMULA	NAME	FORMULA	NAME
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____		
_____	_____				
_____	_____				
_____	_____				