CHE 105 EXAMINATION I September 15, 2011

University of Kentucky Department of Chemistry

READ THESE DIRECTIONS CAREFULLY BEFORE STARTING THE EXAMINATION!

It is *extremely* important that you fill in the answer sheet EXACTLY as indicated, otherwise your answer sheet may not be processed; ALL entries are to be made on SIDE 1 of the answer sheet. Use a #2 pencil (or softer); fill in the circles completely and firmly. Erasures must be complete. Use only the following categories:

NAME:	Print your name starting at the first space, LAST NAME first, then a space, followed by your FIRST NAME, then another space, followed by your MIDDLE INITIAL. Fill in the correct circles below your printed name corresponding to the letters of your name; for the spaces, fill in the top blank circle.
STUDENT NUMBER:	This is **VERY IMPORTANT!** Under IDENTIFICATION NUMBER, put in your **8 DIGIT STUDENT ID NUMBER** (**do not use the 9 at the beginning of your number**) beginning in column A and continuing through column H, column I will be blank, (do NOT use column J at this time); be sure to fill in the correct circles (a common error to be avoided is mistaking "0" for "1").
TEST FORM:	Fill in the "1" blank in the J column under IDENTIFICATION NUMBER (to indicate Hour Examination I).
SPECIAL CODES:	Use for course and section number; in positions K-P write in one of the following: Dr. Woodrum 105-001, 105-005 Dr. Guzman 105-002 Dr. Soult 105-003, 105-004 Dr. Ladipo 105-006 Dr. Kuhler 105-007 Dr. Holler 105-401
SIGNATURE:	You **MUST** sign the examination answer sheet (bubble sheet) on the line directly above your printed name. Use your legal signature.

Answering Questions:

Starting with answer "1" on SIDE 1, fill in the circle indicating the one best answer for each of the **30 questions** in this examination. Your score is the sum of the appropriate credit for each response. On the day following the examination, an examination key will be posted on Blackboard.

Grading and Reporting:

The examination scores will be posted in Blackboard as soon as possible after the examination. If an error has occurred in scoring your answers, inform your instructor within 48 hours of the posting of your score.

BE SURE THAT YOUR TEST HAS 30 QUESTIONS, A PERIODIC TABLE, AND ONE SHEET OF SCRATCH PAPER. You may NOT use your own scratch paper during this examination. Cell phones, computer, and pagers are to be turned off and out of sight during the exam.

1. In the _____ state(s), atoms or molecules are packed close to each other in fixed locations.

A. solid
B. liquid
C. gas
D. liquid and gas

2. Choose the homogeneous mixture from the list below

A. helium
B. beef stew
C. ice
D. air

3. Which of the following is a substance that cannot be broken down into simpler substances by chemical means?

A. element
B. electron
C. compound
D. solution

4. Which of the following statements is an example of a chemical property?

A. Oxygen gas is consumed in the burning of wood.
B. Ice melts above 0˚ C.
C. Lead is denser than aluminum.
D. Table salt (sodium chloride) is soluble in water.

5. A doctor's order is for 0.125 g of ampicillin. The liquid suspension on hand contains 250 mg/5.0 mL. How many milliliters of the suspension are required?

A. 0.0025 mL
B. 3.0 mL
C. 2.5 mL
D. 6.3 mL

6. Express 0.00627 in scientific notation.

A. 6.27×10^{-2}
B. 6.27×10^{-3}
C. 6.27×10^{3}
D. 6.27×10^{2}

7. What is the volume of air (in cubic meters), in a room measuring 14.95 ft by 18.90 ft by 9.00 ft?

A. 774.9 m^3
B. 72.01 m^3
C. 0.8341 m^3
D. 25.52 m^3

8. A sphere with a mass of 143.2 g displaces 23.5 mL of water when placed in a graduated cylinder. What is the density of the sphere?

A. 3.36×10^{3} g/cm^3
B. 6.09 g/cm^3
C. 0.164 g/cm^3
D. 8.65×10^{-1} g/cm^3

9. Which of the following statements is <u>true</u>?

A. All physical properties are intensive.
B. Intensive properties do not depend on the amount of matter present.
C. All physical properties are extensive.
D. Extensive properties do not depend on the amount of matter present.

10. Carry out the following operations and express the answer with the correct number of significant figures.

$(1.3 + 67.809) \times 1.231 =$

A. 84.77
B. 79.9
C. 85.1
D. 85.06

11. A dose of aspirin of 5.0 mg per kilogram of body weight has been prescribed to reduce the fever of an infant weighing 8.5 pounds. The mass in milligrams of aspirin that should be administered is

A. 19 mg.
B. 53 mg.
C. 1.6 mg.
D. 5.0 mg.

12. Which of the following postulates was **NOT** part of Dalton's atomic theory?

A. All atoms of a given element have the same properties.
B. All elements consist of tiny indivisible particles called atoms.
C. Atoms of one element can be converted to atoms of another element.
D. Atoms combine in simple, whole-number ratios to form compounds.

13. Millikan's oil drop experiment enabled the determination of

A. the location of the protons in an atom.
B. the evidence of the neutron in an atom.
C. the charge to mass ratio of the electron.
D. the charge of the electron.

14. Determine the number of neutrons in gallium-71 and write its symbol in the form ${}^{A}_{Z}\mathrm{X}$.

A. 40 neutrons, ${}^{72}_{32}\mathrm{Ge}$
B. 38 neutrons, ${}^{69}_{31}\mathrm{Ga}$
C. 38 neutrons, ${}^{71}_{32}\mathrm{Ge}$
D. 40 neutrons, ${}^{71}_{31}\mathrm{Ga}$

15. Which of the following represents two isotopes of chlorine?

A. ${}^{35}_{17}\mathrm{X}$ and ${}^{35}_{18}\mathrm{X}$
B. ${}^{14}_{7}\mathrm{X}$ and ${}^{15}_{7}\mathrm{X}$
C. ${}^{18}_{17}\mathrm{X}$ and ${}^{18}_{18}\mathrm{X}$
D. ${}^{35}_{17}\mathrm{X}$ and ${}^{36}_{17}\mathrm{X}$

16. Which of the following elements is classified as a nonmetal?

A. Sodium
B. Sulfur
C. Zinc
D. Barium

17. Iodine will_____electron when it forms an ion?

A. lose 1
B. lose 7
C. gain 7
D. gain 1

18. An element has two isotopes with 65.00% of the atoms having a mass of 50.00 amu, and the rest of the atoms having a mass 53.00 amu. The average atomic mass of the element is

A. 50.94 amu.
B. 51.05 amu.
C. 51.50 amu.
D. 51.95 amu.

19. How many moles are in 15.0 grams of iron?

A. 838 mol
B. 3.72 mol
C. 0.269 mol
D. 1.19×10^{-3} mol

20. How many atoms of ^{13}C are there in a 1.15-carat diamond? The natural abundance of C-13 is 1.109%. Diamonds are a form of pure carbon. (1 carat = 2.00×10^{-4} kg)

A. 1.28×10^{20} atoms of ^{13}C
B. 1.15×10^{22} atoms of ^{13}C
C. 1.53×10^{21} atoms of ^{13}C
D. 1.38×10^{23} atoms of ^{13}C

21. Which is the best way to describe an ionic bond?

A. An ionic bond forms from the sharing of electrons between two metal atoms.
B. An ionic bond forms from the sharing of electrons between metal and non-metal atoms.
C. An ionic bond forms from the transfer of electrons from a metal atom to a non-metal atom.
D. An ionic bond forms from the transfer of electrons from a non-metal atom to a metal atom.

22. What is the empirical formula of the compound $C_9H_{24}O_3$?

A. $C_9H_{24}O_3$
B. C_3H_8O
C. CHO
D. $C_{4.5}H_{12}O_{1.5}$

23. Which of the following phrases best describes carbon dioxide?

A. atomic element
B. molecular element
C. molecular compound
D. ionic compound

24. What is the formula of the compound formed between phosphate ion and magnesium ion?

A. $Mg_3(PO_4)_2$
B. $MgPO_4$
C. $Mg_2(PO_4)_3$
D. Mg_3PO_4

25. Which of the following is the correct name for $NiSO_4$?

A. Nickel sulfur tetroxide
B. Nickel sulfate
C. Nickel(I) sulfate
D. Nickel(II) sulfate

26. Write the formula for copper(II) permanganate.

A. $Cu(MnO_4)_2$
B. $CuMnO_4$
C. $Cu(ClO_4)_2$
D. $CuClO_4$

27. Which pair does <u>not</u> correctly match the compound's formula with its name?

A. N_2O_5, dinitrogen pentoxide
B. IF_7, iodine hexafluoride
C. P_4O_8, tetraphoshorus octoxide
D. PF_3, phosphorus trifluoride

28. What is the name of $H_2S(aq)$?

A. sulfuric acid
B. sulfur dihydride acid
C. dihydrogen sulfide acid
D. hydrosulfuric acid

29. Which of the following has been a significant source of gases that cause acid rain?

A. decreased ozone layer protection
B. increased global temperature
C. coal-powered electric plants
D. excessive amounts of methylmercury in fish

30. A mole is an enormous number. If a mole of hydrogen atoms were arranged side by side in a straight line, how long would the line be in meters? The diameter of a hydrogen atom is 74 pm.

A. 4.5×10^{13} meters, which is about three times the distance of Voyager 1 from the sun
B. 6.0×10^{23} meters (a mole of meters), which the distance to galaxy NGC 4414
C. 1.1×10^{13} meters, which is about the distance of Pioneer 10 from the sun
D. 2.4×10^{20} meters, which is about the distance to our nearest galaxy, a dwarf in Canis Major

CHE 105 FALL 2011 Exam 1 key

1. A
2. D
3. A
4. A
5. C
6. B
7. B
8. B
9. B
10. C
11. A
12. C
13. D
14. D
15. D
16. B
17. D
18. B
19. C
20. A
21. C
22. B
23. C
24. A
25. D
26. A
27. B
28. D
29. C
30. A