## **Examination 1A**

# SOME GENERAL INFORMATION

1 in = 2.54 cm 1 mile = 5280 ft 16 oz = 1 lb = 453.6 g 32 liq oz = 1 qt = 0.25 gal = 0.946 L speed of light (c) = 2.998 × 10<sup>8</sup> m/s 1 cal = 4.184 J **INSTRUCTIONS (Read carefully):** This examination has 2 pages of problems, 1 double-sided answer sheet (same color as examination), and 1 blank sheet for scratch work. Read each question carefully. Be sure that you can read one of the periodic tables in the front of the lecture hall; if you cannot, move to a seat where you can. For all problems, provide answers that have the correct number of significant figures. Show your work so that you may receive credit and partial credit for your answers. Put your answers in the space provided on the answer sheet. Show your work! Only the answer sheets will be collected for grading. On *both sides* of the answer sheet, be sure to print your name, sign your name, and give your student number. Good luck!

**REGRADE POLICY:** If you have a question about the number of points that you earned on your graded exam answer sheet, *do not make changes or additions to your returned, graded answer sheet*. Write on a *separate sheet of paper* what items you believe that you were not given sufficient credit and the reasons why you think so. Attach it to your answer sheet and give it to Dr. Hilinski after a lecture or during an office hour, preferably within 2 weeks after it is returned.

*NOTE:* Your graded answers to this examination will be returned to you on Friday, February 1, 2002. Remember that the last day to reduce your course load without the special permission of your academic dean is February 1, 2001 (See the *Spring 2002 Academic Calendar* on the web page at <a href="http://registrar.fsu.edu/dir\_class/spring/acad\_cal.htm">http://registrar.fsu.edu/dir\_class/spring/acad\_cal.htm</a>).

# Part I. [26 pts] Problems 1-5

- [4 pts] Write each of the following in scientific notation and round off to 2 significant figures. Recall that in scientific notation, the decimal part of the number is between 1 and 10.
   (a) 0.003050 (b) 254810
- 2. [4 pts] Write each of the following out in full decimal (expanded) form and convert to 3 significant figures. (a)  $3.7452 \times 10^5$  (b)  $5.795 \times 10^{-3}$
- 3. [9 pts] Perform each of the following mathematical operations.

(a) 
$$(5.460 \times 10^{1}) - (6.92 \times 10^{-1})$$
 (b)  $\frac{2.45 \times 10^{3}}{0.0050}$  (c)  $2648.32 + 8 + 42.7$ 

- 4. [6 pts] Give the names of three states of matter.
- 5. [3 pts] Methane burns in the presence of oxygen. Is this a (*i*) chemical property or (*ii*) physical property? (*choose one*)

# Part II. [24 pts] Problems 6-9

- 6. [6 pts] How many mL of soda are there in a bottle that contains 16 liq oz?
- 7. [6 pts] How many : m are there in 3.70 mm?

### **Examination 1A**

- 8. [6 pts] The density of aluminum is 2.70 g/mL at 25 °C. How many L will 1.7 kg of aluminum occupy at 25 °C?
- 9. [6 pts] Convert each of the following: (a) from 22  $^{\circ}$ F to  $^{\circ}$ C (b) from 85 K to  $^{\circ}$ C

Recall that:  $t_C = \frac{5 \,^{\circ}\text{C}}{9 \,^{\circ}\text{F}} (t_F - 32 \,^{\circ}\text{F})$  and  $t_F = \frac{9 \,^{\circ}\text{F}}{5 \,^{\circ}\text{C}} t_C + 32 \,^{\circ}\text{F}$ 

## Part III. [24 pts] Problems 10-15

- 10. [3 pts] Consider the balloons that Dr. Hilinski used in lecture demonstrations. Which gas is the least dense at room temperature and one atmosphere pressure: (*i*) hydrogen; (*ii*) nitrogen; or (*iii*) oxygen? (*choose one*)
- 11. [6 pts] For the following abbreviations for units, give the correctly spelled full name for the units.
   (a) MJ
   (b) pL
   (c) mK
- 12. [6 pts] For the following names of units, give the abbreviations. (a) microsecond (b) kilocalorie (c) centimeter
- 13. [3 pts] Give the correctly spelled name of an element that is a metal and a liquid at 25 °C and 1 atmosphere pressure.
- 14. [3 pts] Give the correctly spelled name of an element that is a nonmetal and a solid at 25 °C and 1 atmosphere pressure.
- 15. [3 pts] Which one has more potential energy: (*i*) a car being driven in search of a parking space in flat parking lot or (*ii*) the same car parked at the top of a hill? (*choose one*)

# Part IV. [26 pts] Problems 16-20

- 16. [9 pts] For each of the following atomic symbols of elements, give the correctly spelled name.
   (a) Cu
   (b) Mg
   (c) Na
- 17. [6 pts] For each of the following names of elements, give the atomic symbol. (a) lead (b) iron (c) bromine
- 18. [5 pts] Octane is a component of gasoline. The molecular formula of octane is  $C_8H_{18}$ . Write a balanced chemical equation for the combustion of octane.
- 19. [3 pts] Consider the following balanced chemical equation for the reaction of sodium hydroxide with sulfuric acid. What is the total number of oxygen atoms given on the product side of the chemical equation?  $2NaOH + H_2SO_4 6 Na_2SO_4 + 2H_2O$
- 20. (a) [2 pts] When the temperature of 5.0 g of water changes from 55 °C to 75 °C, is heat (*i*) added or (*ii*) removed? (*choose one*)
  (b) [1 pt] Does this represent an (*i*) exothermic or (*ii*) endothermic process? (*choose one*)

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## **Examination 1B**

# SOME GENERAL INFORMATION

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# Part I. [26 pts] Problems 1-5

- 1. [4 pts] Write each of the following out in full decimal (expanded) form and convert to 3 significant figures. (a)  $5.795 \times 10^{-3}$  (b)  $3.7452 \times 10^{5}$
- [4 pts] Write each of the following in scientific notation and round off to 2 significant figures. Recall that in scientific notation, the decimal part of the number is between 1 and 10.
  (a) 0.003050 (b) 254810
- 3. [9 pts] Perform each of the following mathematical operations.

(a) 
$$2648.32 + 8 + 42.7$$
 (b)  $\frac{2.45 \times 10^3}{0.0050}$  (c)  $(5.460 \times 10^1) - (6.92 \times 10^{-1})$ 

- 4. [3 pts] Methane burns in the presence of oxygen. Is this a (*i*) chemical property or (*ii*) physical property? (*choose one*)
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#### **Examination 1B**

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Recall that:  $t_C = \frac{5 \,^{\circ}\text{C}}{9 \,^{\circ}\text{F}} (t_F - 32 \,^{\circ}\text{F})$  and  $t_F = \frac{9 \,^{\circ}\text{F}}{5 \,^{\circ}\text{C}} t_C + 32 \,^{\circ}\text{F}$ 

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# Part IV. [26 pts] Problems 16-20

- 16. [9 pts] For each of the following atomic symbols of elements, give the correctly spelled name. (a) Na (b) Mg (c) Cu
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#### CHM 1030 January 30, 2002 EXAMINATION 1B

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