

To get the most out of this Practice Exam:

- Feel free to use a periodic table, scrap paper, and a non-programmable calculator, but do not use your textbook or lecture notes.
- Set a timer for 50 minutes (the amount of time you'll have for the exam). When the time is up, grade yourself using the **Answer Key** on page 7. It is important to get a sense of the length of time you'll have for the exam. If you are doing well on the questions you complete, but aren't getting to the end of the practice exam, see if you can find areas where you can speed up by practicing.
- Each question is worth 5 pts. If you earn < 73% (less than a "C") you are not yet ready to pass Exam #2.
- Complete the **Practice Exam – Self Reflection** on page 8. It will help you identify your strength/weaknesses and possible resources for getting help.
- Print out one copy of **Practice Exam – Correction Template** on page 9 for each question you get wrong. Use the space on the page to analyze your mistake.
- Get help and/or extra practice with questions you don't understand.

Potentially useful information:

1 m = 39.37 in. 1 in. = 2.54 cm (exactly) 1 mile = 5280 ft = 1.609 km	1 L = 1000 cm ³ = 1.057 qt 1 gal = 4 qt = 8 pt = 3.785 L 1 gal = 128 fluid ounces	1 kg = 2.205 lb 1 lb = 16 oz = 453.6 g
1 cal = 4.184 J 1 Cal = 1000 cal °C = (°F - 32)/1.8 K = °C + 273	density (water) = 1.00 g/mL density (ice) = 0.92 g/mL density (propane) = 0.79 g/mL	C (water) = 4.18 J/g·°C C (lead) = 0.128 J/g·°C C (copper) = 0.385 J/g·°C C (aluminum) = 0.903 J/g·°C C (iron) = 0.449 J/g·°C

- 1) What is the formula for nickel(II) oxalate?
 A) Ni₂C₂O₄ B) NiC₂O₇ C) NiC₂O₄
 D) Ni(C₂O₇)₂ E) Ni(C₂O₄)₂ F) Ni₂C₂O₇
- 2) How many sig figs are in each of the following two measurements: 0.0550010 and 1080.0
 A) 8 and 3 B) 6 and 3 C) 5 and 5
 D) 5 and 3 E) 8 and 5 F) 6 and 5
- 3) How many ns are in 4.5 ms?
 A) 4.5 x 10⁻⁶ ns B) 4.5 x 10⁻³ ns C) 4.5 x 10¹² ns
 D) 4.5 x 10⁻¹² ns E) 4.5 x 10³ ns F) 4.5 x 10⁶ ns

- 4) What metric prefix goes with the exponent, 10^9 ?
- | | | |
|---------|----------|---------|
| A) mega | B) micro | C) nano |
| D) tera | E) giga | F) pico |
- 5) What distance (in m) would you get if you added the following: $28 \text{ cm} + 0.00098 \text{ km}$?
- | | | |
|--------------------------------|-----------|---------------|
| A) $1.3 \times 10^2 \text{ m}$ | B) 1.26 m | C) 1.2 m |
| D) 1 m | E) 1.3 m | F) 28.00098 m |
- 6) What is the name of $\text{Pb}_3(\text{PO}_3)_2$?
- | | | |
|------------------------|------------------------|------------------------|
| A) lead(II) phosphate | B) lead(II) phosphite | C) lead(III) phosphate |
| D) trilead diphosphate | E) lead(III) phosphite | F) trilead phosphite |
- 7) Which of the following perfect cubes has the highest density? A cube having...
- | |
|-----------------------------------------------------|
| A) mass of 1 g and measuring 1 cm on each side |
| B) mass of 0.01 g and measuring 0.1 cm on each side |
| C) mass of 1000 g and measuring 10 cm on each side |
| D) mass of 100 g and measuring 10 cm on each side |

8) What is the formula mass of calcium acetate?

A) 158.168 amu

B) 158.17 amu

C) 158.2 amu

D) 115.12 amu

E) 115.1 amu

F) 115.124 amu

9) Calculate the answer with the correct significant figures: $(0.54 + 104.60)/(106.59)$

A) 0.99

B) 0.98640

C) 0.9864

D) 1.0

E) 0.986

F) 0.986396

10) How many ft^3 are in 45 cm^3 ?

A) $1.3 \times 10^6 \text{ ft}^3$

B) $1.4 \times 10^3 \text{ ft}^3$

C) $4.7 \times 10^3 \text{ ft}^3$

D) $1.6 \times 10^{-3} \text{ ft}^3$

E) 1.5 ft^3

F) 0.43 ft^3

11) What is the formula mass of iodic acid?

- A) 159.9 amu
- B) 159.91 amu
- C) 159.908 amu
- D) 143.9 amu
- E) 143.91 amu
- F) 143.908 amu

12) Which of the following statements is false?

- A) The products of a chemical reaction are always lower in energy than the reactants.
- B) Absolute zero (defined as 0 K) is the coldest possible temperature.
- C) Melting ice is an endothermic process.
- D) A temperature change of one Kelvin is the same as one degree Celsius.
- E) The joule (J) is the SI unit of energy.
- F) An exothermic chemical reaction releases energy.
- G) A substance's temperature is related to the motion of its atoms.

13) The following four metal samples all start at the same temperature. Which of the samples will end up getting the hottest if 100.0 J is added to each?

- A) 20 g sample of aluminum
- B) 10 g sample of iron
- C) 10 g sample of lead
- D) 20 g sample of copper

- 14) According to what was said in lecture, which of the following statements most closely matches the way a chemist talks about the kinetic energy of a baseball?
- A) The energy due to the location of the whole baseball
 - B) The energy due to the motion of the atoms and molecules making up the baseball
 - C) The energy that it took to make the baseball
 - D) The energy trapped in the chemical bonds within the baseball
 - E) The energy due to the speed of the whole baseball
 - F) None of these statements

- 15) A 1.00 g sample of pure ice contains approximately 3.34×10^{22} water molecules. How many water molecules are there in a block of ice with a volume of 11.7 pt?
- A) 1.8×10^{26} molecules
 - B) 1.6×10^{-19} molecules
 - C) 1.7×10^{26} molecules
 - D) 1.6×10^{-25} molecules
 - E) 2.1×10^{20} molecules
 - F) 1.7×10^{20} molecules

- 16) It takes 180. J to increase the temperature of 0.0331 lb of an unknown substance from 55.0°F to 124.0°F. What is the specific heat capacity (in J/g·°C) of the unknown substance?
- A) 0.174 J/g·°C
 - B) 78.8 J/g·°C
 - C) 0.313 J/g·°C
 - D) 0.490 J/g·°C
 - E) 0.225 J/g·°C
 - F) 142 J/g·°C

17) A backpacker wants to carry enough propane to heat 2.00 L of water from 25.0°C to its boiling point. If each gram of propane can generate 29.5 kJ of heat, what volume of propane (in mL) should the backpacker take with her camping?

A) 17 mL

B) 9.0 mL

C) 2.7×10^4 mL

D) 27 mL

E) 1.7×10^4 mL

F) 9.0×10^3 mL

18) A 30.0 g sample of copper is heated and dropped into 150.0 g of water. If the water started at 35.0°C and ended up at 41.4°C after adding the copper, what was the starting temperature of the copper? Report your final answer with 3 sig figs.

A) 312°C

B) 389°C

C) 261°C

D) 306°C

E) -312°C

F) 382°C

- 19) Which of the following relationships does not have an infinite number of significant figures?
- A) $1 \text{ L} = 1000 \text{ cm}^3$ B) $1 \text{ in.} = 2.54 \text{ cm}$ C) $1 \text{ kg} = 2.205 \text{ lb}$
D) $1 \text{ lb} = 16 \text{ oz}$ E) $1 \text{ Gm} = 10^9 \text{ m}$

- 20) A hybrid automobile gets 58 mpg. What is the car's gas mileage in km/mL?
- A) 0.046 km/mL B) 0.14 km/mL C) 0.35 km/mL
D) 0.025 km/mL E) 0.0095 km/mL

Answer Key: Each question is worth 5 pts

1) C	2) F	3) F	4) E	5) B
6) B	7) B	8) B	9) B	10) D
11) A	12) A	13) C	14) B	15) C
16) C	17) D	18) B	19) C	20) D

Practice Exam – Correction Template

(print out 1 copy of this template for each question you got wrong)

- 1) What question # from the practice exam are you correcting?
- 2) What concepts are being dealt with in the question? In other words, what type of problem is it?
- 3) Where in your textbook (what page) and when in your lecture notes (what date) is this type of problem dealt with?

Part I: Working a similar problem to the one you got wrong

- 4) Write out a similar problem and all the work needed for you to fully understand it. [Continue on back as needed.]

Part II: Correcting the problem you got wrong

- 5) Write out the question that you got wrong and all the work needed for you to fully understand it. Include clarifying/explanatory comments. [Continue on back as needed.]