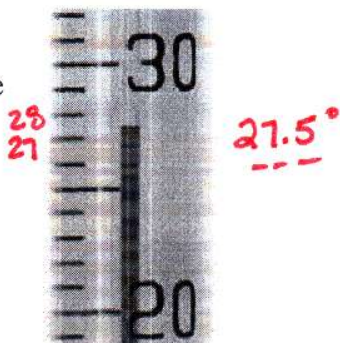


# 1 • Matter and Measurement

## PRACTICE TEST

1. How many significant digits are present in the temperature read from the thermometer illustrated to the right?



- a) 1      b) 2      **c) 3**      d) 4

2. The dimensions of a rectangular solid are 8.00 cm long, 4.00 cm wide, and 2.00 cm high. If the density of the solid is 10.0 g/cm<sup>3</sup>, what is its mass? *Vol = L x W x H = 64.0 cm<sup>3</sup>*

- a) 10/64 grams      d) 320 grams  
 b) 10.0 grams      **e) 640 grams (sig figs?)**

*64.0 cm<sup>3</sup> x  $\frac{10.0 \text{ g}}{\text{cm}^3} = 640. \text{ g}$*

3. A metal sample weighing 30.9232 grams was added to a graduated cylinder containing 23.26 mL of water. The volume of water plus the sample was 24.85 mL. Which setup will result in the density of this metal?

- a)  $30.9232 \times (24.85 - 23.26)$

**b)  $\frac{30.9232}{24.85 - 23.26}$**

c)  $\frac{24.85 - 23.26}{30.9232}$

d)  $30.9232 \times \frac{24.85}{23.26}$

e)  $\frac{30.9232}{24.85 + 23.26}$

*Vol = 24.85  
 - 23.26  
 -----  
 1.59*

*D =  $\frac{m}{V} = \frac{30.9232}{(24.85 - 23.26)}$*

4. The number of significant digits in 0.30500 is

- a) 1      d) 4  
 b) 2      **e) 5**  
 c) 3

5. A box measures 3.50 cm x 2.915 cm. The **3 S.F.** product of these numbers = 10.2025 cm<sup>2</sup>. What is the proper way to report the area of the box?

- a) 10.20 cm<sup>2</sup>      c) 10 cm<sup>2</sup>  
**b) 10.2 cm<sup>2</sup>**      d) 10. cm<sup>2</sup>

6. The result of 2.350 x (4.0 + 6.311) is, *4 SF      3 SF*

- a) 24      c) 24.21  
**b) 24.2**      d) 24.205

*6.311  
 + 4.0  
 -----  
 10.311  
 3 S.F.*

*BE CAREFUL WHEN + or - WITH SIG. FIGS.*

7. A student does a calculation using her calculator and the number 280.27163 is shown on the display. If there are actually three significant figures, how should she show the final answer?

- a) 280 *2 SF*      d)  $2.80 \times 10^{-2} = .0280$   
 b) 280.3 *4 SF*      **e)  $2.80 \times 10^2$**   
 c) 280.27 *5 SF*      *or 280. would be 3 S.F.*

8. The term that refers to the reproducibility of a laboratory measurement is

- a) precision**      c) accuracy  
 b) repeatability      d) exactness

9. Which measurement below is NOT written with three significant digits?

- ~~a) 2.00 cm~~      **c) 0.003 L 1 SF**  
~~b) 550. grams~~      ~~d) 12.7 mm~~

$$6.33 \times 100$$

10. The number  $6.33 \times 10^2$  equals,

- a) 6.33                      **c) 633**  
b) 0.633                    d) 0.0633

11. All the following are characteristic properties of phosphorus. Which one is a chemical property?

- ~~a) Both red phosphorus and white phosphorus exist in solid allotropic forms.~~  
~~b) The red form melts at about  $600^\circ\text{C}$  and the white form melts at  $44^\circ\text{C}$ .~~  
~~c) The white form is soluble in liquid carbon disulfide, but is insoluble in water.~~  
**d) When exposed to air, white phosphorus will burn spontaneously, but red phosphorus will not.**

12. Classify each observation as a physical or a chemical property and tally them.

Observation 1: Bubbles form on a piece of metal when it is dropped into acid.

*chem*

Observation 2: The color of a crystalline substance is yellow.

*phys*

Observation 3: A shiny metal melts at  $650^\circ\text{C}$ .

*phys*

Observation 4: The density of a solution is  $1.84 \text{ g/cm}^3$

*phys*

- a) 2 chemical properties and 2 physical properties  
b) 3 chemical properties and 1 physical properties.  
**c) 1 chemical properties and 3 physical properties**  
d) 4 chemical properties  
e) 4 physical properties

13. Chromatography is a good way to separate the

- a) elements in a compound  
**b) the components in a mixture**  
c) the atoms in an element  
d) the phases of a pure substance

14. When a pure solid substance was heated, a student obtained another solid and a gas, each of which was a pure substance. From this information which of the following statements is ALWAYS a correct conclusion?

- a) The original solid is not an element. *must be a compound***  
~~b) Both products are elements. *? maybe*~~  
~~c) The original solid is a compound and the gas is an element. *maybe*~~  
~~d) The original solid is an element and the gas is a compound.~~  
~~e) Both products are compounds. *maybe*~~

15. The prefix "milli-" corresponds to what multiplication factor?

- a)  $10^{-6}$  ?                      d)  $10^3$  *kilo*  
**b)  $10^{-3}$**                               e)  $10^6$  *mega*  
c)  $10^1$  ?

16. A solution of sugar water may be defined as a

- a) heterogeneous mixture  
**b) homogeneous mixture *looks like one phase***  
c) heterogeneous compound  
d) homogeneous compound  
e) homogeneous element

17. "Wafting" is the proper technique for

- a) neutralizing a spilled acid.
- b) putting out burning clothing.
- c) washing chemicals from the eye.
- d) smelling a chemical substance.
- e) observing the color of a chemical.

18. You measure the density of a slab of lead as 11.10 g/mL. The accepted value is 11.34 g/mL.

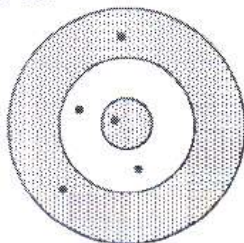
The percent error for your measurement is

- a) 2.1 %
  - b) 2.4 %
  - c) 3.7 %
  - d) 5.1 %
- $$\frac{(11.34 - 11.10)}{11.34} \times 100 = 2.1164 \text{ (2 S.F.)}$$

19. Which one of the following elements is correctly matched with its symbol?

- a) Ag, gold *silver*
- b) Ni, nickel
- c) Fl, fluorine *F not Fl*
- d) Mg, manganese *magnesium*
- e) H, helium *He*  
*Hydrogen*

20. The marks on the following target represent someone who is:



- a) accurate, but not precise.
- b) precise, but not accurate.
- c) both accurate and precise.
- d) neither accurate nor precise.

*not centered on the bulls eye*

*not close together*

**Answers:** (Please use CAPITAL letters)

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

Answers:

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