11) $683 mm \times \dfrac{1 m}{1000 mm} \times \dfrac{100 cm}{1 m} = \underline{68.3} cm$

12) $25 ml \times \dfrac{1 L}{1000 ml} = .025$

Practice Problems: Measurement

1. Express 549000000 in scientific notation.

   [A] 5.49×10^{-8} [B] 5.49×10^8 [C] 549×10^8 [D] 549×10^6 [E] 54.9×10^{-7}

2. Express 506100 in scientific notation.

   [A] 5.06100×10^5 [B] 5.1×10^5 [C] 5×10^5 [D] 5.061×10^5 [E] 51×10^5

3. Write 4,251 in standard scientific notation.

   [A] 4.251 [B] 4.251×1000 [C] 42.52×10^2 [D] 4.251 [E] 4.251×10^3

4. The number 0.000402 expressed in exponential notation is

   [A] 4.02×10^3 [B] 4.02×10^{-3} [C] 4.02×10^{-4}

   [D] 4.02×10^{-4} [E] 4.02×10^2

   ??? I don't know why I put this twice!

5. One kilogram contains this many grams.

   [A] 1000   [B] 10   [C] 1/100   [D] 1/1000   [E] 100

6. How many milliliters are in 0.020 L?

   [A] 200 mL   [B] 0.20 mL   [C] 2.0 mL   [D] 20. mL   [E] 5.0 mL

7. The measurement 4.3×10^3 g also could be written as

   [A] 4.3 dg   [B] 4.3 kg   [C] 4.3 pg   [D] 4.3 mg   [E] 4.3 g

8. How many millimeters are in 251 centimeters?

   [A] 2.51×10^3 mm   [B] 2.51 mm   [C] 2.51×10^2 mm

   [D] 2.51×10^{-2} mm   [E] 2.51×10^1 mm

9. Convert: 1 cm = ___10___ mm.

10. Convert: 4.96 kg = ___4.96×10^6___ mg.

11. Convert: 683 mm = ___68.3___ cm.

12. Convert: 25 mL = ___0.025___ L.

6) $0.020 L \times \dfrac{1000 ml}{1 L} = 20 ml$

   20, or 2.0×10^1 ml

7) $4.3 \times 10^3 g \times \dfrac{1 kg}{1000 g} = 4.3 kg$

10) $4.96 kg \times \dfrac{1000 g}{1 kg} \times \dfrac{1000 mg}{1 g} = 4.96 \times 10^6 mg$

8) $251 cm \times \dfrac{1 m}{100 cm} \times \dfrac{1000 mm}{1 m} = \underline{2510} mm$

13. One milli̶second is equal to how many seconds? = 1/1000 of a second

   [A] 10^{-3} s   [B] 10^6 s   [C] 10^{-6} s   [D] 10^3 s   [E] 1 s

14. The fundamental unit of mass in the metric system is the

   [A] milliliter   [B] kilometer   [C] centimeter   [D] meter   [E] gram   Actually, it's the kilogram!

15. A cubic centimeter (cm^3) is equivalent to what other metric volume unit?

   [A] millimeter   [B] liter   [C] centimeter   [D] deciliter   [E] milliliter

16. The number of millimeters in 0.101 meter is $0.101\, m \times \dfrac{1000\,mm}{1\,m} = 101\, mm$

   [A] 9.90×10^3 mm   [B] 1.01×10^{-3} mm   [C] 1.01×10^{-4} mm

   [D] 1.01×10^4 mm   [E] 1.01×10^2 mm

17. The number of cubic centimeters (cm^3) in 43.0 mL is $1 cm^3$ is the same thing as a mL

   [A] 0.0430 cm^3 [B] 43.0 cm^3 [C] 4.30 cm^3 [D] none of these

18. A student finds that the weight of an empty beaker is 12.024 g. She places a solid in the beaker to give a combined mass of 12.108 g. To how many significant figures is the mass of the solid known?

   [A] 4   [B] 2   [C] 3   [D] 5   [E] 1

19. How many significant figures are in the number 4.00700×10^{13}?   6 sig figs

   [A] none of these   [B] 2   [C] 4   [D] 6   [E] 5

20. Convert 258 L to milliliters.

   [A] 2.58×10^3 mL   [B] 2.58×10^5 mL   [C] 0.258 mL

   [D] 258 mL   [E] 2.58 mL

21. Convert 561097 mm to kilometers.

   [A] 561.097 km   [B] 5.61097×10^{11} km   [C] 5.61097 km

   [D] 0.561097 km   [E] 5610.97 km

18) empty beaker + solid thing = total mass

   $12.024 + X = 12.108$

   $\begin{array}{r} 12.108 \\ -12.024 \\ \hline 0.084 \end{array}$

20) $258 L \times \dfrac{1000\,mL}{1\,L} = 258000\,mL$ → $2.58 \times 10^5\,mL$

21) $561097\,mm = \underline{\qquad} km$

   → $561097\,mm \times \dfrac{1\,m}{1000\,mm} \times \dfrac{1\,km}{1000\,m} = 0.561097\,km$