

**MULTIPLE CHOICE.** Choose the one alternative that best completes the statement or answers the question.

- 1) Solids have a \_\_\_\_\_ shape and are not appreciably \_\_\_\_\_. 1) \_\_\_\_\_  
A) indefinite, compressible  
B) sharp, convertible  
C) indefinite, incompressible  
D) definite, incompressible  
E) definite, compressible
- 2) \_\_\_\_\_ is the chemical symbol for elemental sodium. 2) \_\_\_\_\_  
A) So                      B) Na                      C) W                      D) S                      E) Sn
- 3) If matter is uniform throughout, cannot be separated into other substances by physical processes, but can be decomposed into other substances by chemical processes, it is called a (an) \_\_\_\_\_. 3) \_\_\_\_\_  
A) element  
B) mixture of elements  
C) heterogeneous mixture  
D) homogeneous mixture  
E) compound
- 4) The symbol for the element potassium is \_\_\_\_\_. 4) \_\_\_\_\_  
A) P                      B) K                      C) Ca                      D) S                      E) Pt
- 5) The symbol for the element magnesium is \_\_\_\_\_. 5) \_\_\_\_\_  
A) Rb                      B) Si                      C) Ne                      D) Mn                      E) Mg
- 6) The initial or tentative explanation of an observation is called a(n) \_\_\_\_\_. 6) \_\_\_\_\_  
A) theory  
B) test  
C) experiment  
D) hypothesis  
E) law

- 7) A concise verbal statement or mathematical equation that summarizes a broad variety of observations and experiences is called a(n) \_\_\_\_\_. 7) \_\_\_\_\_
- A) law
  - B) hypothesis
  - C) test
  - D) theory
  - E) experiment
- 8) A separation process that depends on differing abilities of substances to form gases is called \_\_\_\_\_. 8) \_\_\_\_\_
- A) chromatography
  - B) filtration
  - C) all of the above are correct
  - D) solvation
  - E) distillation
- 9) The SI unit for mass is \_\_\_\_\_. 9) \_\_\_\_\_
- A) troy ounce
  - B) none of the above
  - C) gram
  - D) kilogram
  - E) pound
- 10) A one degree of temperature difference is the smallest on the \_\_\_\_\_ temperature scale. 10) \_\_\_\_\_
- A) Kelvin
  - B) Fahrenheit and Celsius
  - C) Kelvin and Celsius
  - D) Celsius
  - E) Fahrenheit
- 11) A common English set of units for expressing velocity is miles/hour. The SI unit for velocity is \_\_\_\_\_. 11) \_\_\_\_\_
- A) km/s      B) cm/s      C) m/s      D) m/hr      E) km/hr
- 12) The unit of force in the English measurement system is  $\frac{\text{lb} \cdot \text{ft}}{\text{s}^2}$ . The SI unit of force is the Newton, which is \_\_\_\_\_ in base SI units. 12) \_\_\_\_\_
- A)  $\frac{\text{g} \cdot \text{m}}{\text{s}^2}$
  - B)  $\frac{\text{g} \cdot \text{cm}}{\text{s}^2}$
  - C)  $\frac{\text{g} \cdot \text{cm}}{\text{s}}$
  - D)  $\frac{\text{kg} \cdot \text{m}}{\text{hr}^2}$
  - E)  $\frac{\text{kg} \cdot \text{m}}{\text{s}^2}$

- 13) Momentum is defined as the product of mass and velocity. The SI unit for momentum is \_\_\_\_\_? 13) \_\_\_\_\_  
 A)  $\frac{\text{kg} \cdot \text{m}}{\text{hr}}$  B)  $\frac{\text{g} \cdot \text{km}}{\text{s}}$  C)  $\frac{\text{kg} \cdot \text{m}}{\text{s}}$  D)  $\frac{\text{kg} \cdot \text{km}}{\text{hr}}$  E)  $\frac{\text{g} \cdot \text{m}}{\text{s}}$
- 14) The SI unit of temperature is \_\_\_\_\_. 14) \_\_\_\_\_  
 A) K B) T C) °F D) t E) °C
- 15) The temperature of 25°C is \_\_\_\_\_ in Kelvins. 15) \_\_\_\_\_  
 A) 138 B) 166 C) 248 D) 103 E) 298
- 16) The freezing point of water at 1 atm pressure is \_\_\_\_\_. 16) \_\_\_\_\_  
 A) -32°F B) 0°C C) 0 K D) -273°C E) 0°F
- 17) A temperature of 400 K is the same as \_\_\_\_\_°F. 17) \_\_\_\_\_  
 A) 286 B) 261 C) 88 D) 127 E) 103
- 18) A temperature of \_\_\_\_\_ K is the same as 63°F. 18) \_\_\_\_\_  
 A) 290 B) 336 C) 276 D) 17 E) 29
- 19) 1 nanometer = \_\_\_\_\_ picometers 19) \_\_\_\_\_  
 A) 1 B) 10 C) 1000 D) 0.01 E) 0.1
- 20) 1 picometer = \_\_\_\_\_ centimeters 20) \_\_\_\_\_  
 A)  $1 \times 10^8$  B)  $1 \times 10^{-8}$  C)  $1 \times 10^{-12}$  D)  $1 \times 10^{-10}$  E)  $1 \times 10^{10}$
- 21) 1 kilogram = \_\_\_\_\_ milligrams 21) \_\_\_\_\_  
 A)  $1 \times 10^{-6}$   
 B) 1,000,000  
 C) 1,000  
 D) 10,000  
 E) none of the above
- 22) "Absolute zero" refers to \_\_\_\_\_. 22) \_\_\_\_\_  
 A) 0 Kelvin  
 B) 0° Fahrenheit  
 C) °C + 9/5(°F - 32)  
 D) 273.15°C  
 E) 0° Celsius

- 23) An object will sink in a liquid if the density of the object is greater than that of the liquid. The mass of a sphere is 9.83 g. If the volume of this sphere is less than \_\_\_\_\_  $\text{cm}^3$ , then the sphere will sink in liquid mercury (density =  $13.6 \text{ g/cm}^3$ ). 23) \_\_\_\_\_
- A) 1.38  
 B) 134  
 C) 7.48  
 D) 0.723  
 E) none of the above
- 24) The density (in  $\text{g/cm}^3$ ) of a gold nugget that has a volume of  $1.68 \text{ cm}^3$  and a mass of 32.4 g is \_\_\_\_\_. 24) \_\_\_\_\_
- A) 0.0519      B) 32.4      C) 0.0184      D) 19.3      E) 54.4
- 25) The density of silver is  $10.5 \text{ g/cm}^3$ . A piece of silver with a mass of 61.3 g would occupy a volume of \_\_\_\_\_  $\text{cm}^3$ . 25) \_\_\_\_\_
- A) 5.84      B) 644      C) 0.00155      D) 0.171      E) 10.5
- 26) The density of silver is  $10.5 \text{ g/cm}^3$ . A piece of silver that occupies a volume of  $23.6 \text{ cm}^3$  would have a mass of \_\_\_\_\_. 26) \_\_\_\_\_
- A) 112      B) 248      C) 23.6      D) 0.445      E) 2.25
- 27) A certain liquid has a density of  $2.67 \text{ g/cm}^3$ . 1340 g of this liquid would occupy a volume of \_\_\_\_\_ L. 27) \_\_\_\_\_
- A) 3.58  
 B)  $1.99 \times 10^{-3}$   
 C) 0.502  
 D) 50.2  
 E) 35.8
- 28) A certain liquid has a density of  $2.67 \text{ g/cm}^3$ . 30.5 mL of this liquid would have a mass of \_\_\_\_\_ Kg. 28) \_\_\_\_\_
- A) 0.0814      B) 81.4      C) 0.0114      D) 11.4      E) 0.0875
- 29) Osmium has a density of  $22.6 \text{ g/cm}^3$ . The mass of a block of osmium that measures  $1.01 \text{ cm} \times 0.233 \text{ cm} \times 0.648 \text{ cm}$  is \_\_\_\_\_. 29) \_\_\_\_\_
- A)  $6.75 \times 10^3$   
 B) 3.45  
 C) 34.5  
 D)  $6.75 \times 10^{-3}$   
 E) 148

- 30)  $3.337 \text{ g/cm}^3 = \text{_____ kg/m}^3$  30) \_\_\_\_\_  
 A) 3337  
 B) 333.7  
 C)  $3.337 \times 10^{-5}$   
 D)  $3.337 \times 10^{-9}$   
 E) 0.3337
- 31) The number 0.00430 has \_\_\_\_\_ significant figures. 31) \_\_\_\_\_  
 A) 3                      B) 6                      C) 4                      D) 2                      E) 5
- 32) The number 1.00430 has \_\_\_\_\_ significant figures. 32) \_\_\_\_\_  
 A) 2                      B) 3                      C) 6                      D) 4                      E) 5
- 33) The correct answer (reported to the proper number of significant figures) to the following is \_\_\_\_\_ 33) \_\_\_\_\_  
 $6.3 \times 3.25 = \text{_____}$   
 A) 20.48                      B) 21                      C) 20.475                      D) 20.5                      E) 20.
- 34) One side of a cube measures 1.55 m. The volume of this cube is \_\_\_\_\_  $\text{cm}^3$ . 34) \_\_\_\_\_  
 A)  $3.72 \times 10^6$                       B)  $2.40 \times 10^4$                       C) 2.40                      D) 3.72                      E) 155
- 35) The length of the side of a cube (in cm) having a volume of 44.4 L is \_\_\_\_\_. 35) \_\_\_\_\_  
 A) 35.4                      B) 875                      C) 0.354                      D) 66.6                      E) 6.66
- 36)  $45 \text{ m/s} = \text{_____ km/hr}$  36) \_\_\_\_\_  
 A) 2.7                      B)  $1.6 \times 10^2$                       C) 0.045                      D)  $1.6 \times 10^5$                       E)  $2.7 \times 10^3$
- 37) If an object, beginning at rest, is moving at a speed of 700 m/s after 2.75 min, its rate of acceleration (in  $\text{m/s}^2$ ) is \_\_\_\_\_. (Assume that the rate of acceleration is constant.) 37) \_\_\_\_\_  
 A)  $1.16 \times 10^5$                       B) 4.24                      C) 255                      D)  $1.53 \times 10^4$                       E) 193

38) The correct result (indicating the proper number of significant figures) of the following addition is 38) \_\_\_\_\_

$$\begin{array}{r} \text{_____} \\ 12 \\ 1.2 \\ 0.12 \\ + 0.012 \\ \hline \end{array}$$

- A) 13
- B) 13.3
- C) 13.33
- D) 13.332
- E) none of the above

39)  $\frac{(0.002843)(12.80184)}{0.00032} =$  \_\_\_\_\_ 39) \_\_\_\_\_

- A) 113.74
- B) 113.7
- C)  $1.1 \times 10^2$
- D) 113.73635
- E) 113.736

40) The correct result of the molecular mass calculation for  $\text{H}_2\text{SO}_4$  is \_\_\_\_\_ 40) \_\_\_\_\_

$$4 \times 15.9994 + 32.066 + 2 \times 1.0079$$

- A) 98.84
- B) 98.08
- C) 98.074
- D) 98.838
- E) 98.079

41) The volume of a regular cylinder is  $V = \pi r^2 h$ . Using the value 3.1416 for the constant  $\pi$ , the volume ( $\text{cm}^3$ ) of a cylinder of radius 2.34 cm and height 19.91 cm expressed to the correct number of significant figures is \_\_\_\_\_ 41) \_\_\_\_\_

- A) 342.495
- B) 342.49471
- C) 342.49
- D) 343
- E) 342

42) There are \_\_\_\_\_ significant figures in the answer to the following computation: 42) \_\_\_\_\_

$$\frac{(29.2 - 20.0)(1.79 \times 10^5)}{1.39}$$

- A) 1
- B) 2
- C) 3
- D) 4
- E) 5

43) There should be \_\_\_\_\_ significant figures in the answer to the following computation. 43) \_\_\_\_\_

$$\frac{(10.07 + 7.395)}{2.5}$$

- A) 1
- B) 2
- C) 3
- D) 4
- E) 5

44) \_\_\_\_\_ significant figures should be retained in the result of the following calculation. 44) \_\_\_\_\_

$$\frac{(11.13 - 2.6) \times 10^4}{(103.05 + 16.9) \times 10^{-6}}$$

- A) 1                      B) 2                      C) 3                      D) 4                      E) 5

45) The output of a plant is 4335 pounds of ball bearings per week (five days). If each ball bearing weighs 0.0113 g, how many ball bearings does the plant make in a single day? (Indicate the number in proper scientific notation with the appropriate number of significant figures.) 45) \_\_\_\_\_

- A)  $2.91 \times 10^6$               B)  $7.67 \times 10^4$               C) 867                      D)  $3.48 \times 10^7$               E)  $3.84 \times 10^5$

46) The density of mercury is 13.6 g/cm<sup>3</sup>. The density of mercury is \_\_\_\_\_ kg/m<sup>3</sup>. 46) \_\_\_\_\_

- A)  $1.36 \times 10^{-4}$   
B)  $1.36 \times 10^{-2}$   
C)  $1.36 \times 10^{-5}$   
D)  $1.36 \times 10^8$   
E)  $1.36 \times 10^4$

47) The quantity 1.0 mg/cm<sup>2</sup> is the same as 1.0 × \_\_\_\_\_ kg/m<sup>2</sup>. 47) \_\_\_\_\_

- A) 10<sup>-6</sup>                      B) 10<sup>2</sup>                      C) 10<sup>-4</sup>                      D) 10<sup>4</sup>                      E) 10<sup>-2</sup>

48) The quantity \_\_\_\_\_ m is the same as 3 km. 48) \_\_\_\_\_

- A) 0.03                      B) 3000                      C) 300                      D) 0.003                      E) 30

49) There are \_\_\_\_\_ ng in a pg. 49) \_\_\_\_\_

- A) 100                      B) 1000                      C) 0.001                      D) 0.01                      E) 10

50) One edge of a cube is measured and found to be 13 cm. The volume of the cube in m<sup>3</sup> is \_\_\_\_\_ 50) \_\_\_\_\_

- A)  $2.2 \times 10^6$               B)  $2.2 \times 10^{-3}$               C)  $2.2 \times 10^3$               D)  $2.2 \times 10^{-6}$               E) 2.2

51) The density of lead is 11.4 g/cm<sup>3</sup>. The mass of a lead ball with a radius of 0.50 mm is \_\_\_\_\_ g. 51) \_\_\_\_\_  
( $V_{\text{sphere}} = 4\pi r^3/3$ )

- A) 4.6                      B) 6.0                      C)  $4.6 \times 10^{-5}$               D)  $4.6 \times 10^{-2}$               E)  $6.0 \times 10^{-3}$

- 52) In the following list, only \_\_\_\_\_ is not an example of matter. 52) \_\_\_\_\_
- A) dust
  - B) planets
  - C) elemental phosphorus
  - D) table salt
  - E) light
- 53) What is the physical state in which matter has no specific shape but does have a specific volume? 53) \_\_\_\_\_
- A) ice
  - B) salts
  - C) solid
  - D) liquid
  - E) gas
- 54) The law of constant composition applies to \_\_\_\_\_. 54) \_\_\_\_\_
- A) homogeneous mixtures
  - B) solutions
  - C) heterogeneous mixtures
  - D) compounds
  - E) solids
- 55) A combination of sand, salt, and water is an example of a \_\_\_\_\_. 55) \_\_\_\_\_
- A) solid
  - B) heterogeneous mixture
  - C) homogeneous mixture
  - D) pure substance
  - E) compound
- 56) Which one of the following has the element name and symbol correctly matched? 56) \_\_\_\_\_
- A) C, copper
  - B) Sn, silicon
  - C) Mg, manganese
  - D) Ag, silver
  - E) P, potassium
- 57) Which one of the following has the element name and symbol correctly matched? 57) \_\_\_\_\_
- A) S, sodium
  - B) Tn, tin
  - C) B, bromine
  - D) Fe, iron
  - E) N, neon



- 58) Which one of the following elements has a symbol that is not derived from its foreign name? 58) \_\_\_\_\_  
A) mercury      B) tin      C) lead      D) copper      E) aluminum
- 59) Which one of the following is a pure substance? 59) \_\_\_\_\_  
A) concrete  
B) milk  
C) salt water  
D) elemental copper  
E) wood
- 60) Which one of the following is often easily separated into its components by simple techniques such as filtering or decanting? 60) \_\_\_\_\_  
A) heterogeneous mixture  
B) solutions  
C) compounds  
D) homogeneous mixture  
E) elements
- 61) Which states of matter are significantly compressible? 61) \_\_\_\_\_  
A) solids only  
B) solids and liquids  
C) liquids and gases  
D) liquids only  
E) gases only
- 62) For which of the following can the composition vary? 62) \_\_\_\_\_  
A) homogeneous mixture  
B) element  
C) pure substance  
D) heterogeneous mixture  
E) both homogeneous and heterogeneous mixtures

- 63) If matter is uniform throughout and cannot be separated into other substances by physical means, it is \_\_\_\_\_. 63) \_\_\_\_\_
- A) either an element or a compound
  - B) a heterogeneous mixture
  - C) a homogeneous mixture
  - D) a compound
  - E) an element
- 64) An element cannot \_\_\_\_\_. 64) \_\_\_\_\_
- A) be separated into other substances by chemical means
  - B) interact with other elements to form compounds
  - C) be part of a homogeneous mixture
  - D) be a pure substance
  - E) be part of a heterogeneous mixture
- 65) Homogeneous mixtures are also known as \_\_\_\_\_. 65) \_\_\_\_\_
- A) substances
  - B) solids
  - C) elements
  - D) solutions
  - E) compounds
- 66) The law of constant composition says \_\_\_\_\_. 66) \_\_\_\_\_
- A) that the composition of a homogeneous mixture is always the same
  - B) that the composition of an element is always the same
  - C) that all substances have the same composition
  - D) that the composition of a compound is always the same
  - E) that the composition of a heterogeneous mixture is always the same
- 67) Which of the following is an illustration of the law of constant composition? 67) \_\_\_\_\_
- A) Water is 11% hydrogen and 89% oxygen by mass.
  - B) Water is a compound.
  - C) Water and salt have different boiling points.
  - D) Water boils at 100°C at 1 atm pressure.
  - E) Water can be separated into other substances by a chemical process.

- 68) In the following list, only \_\_\_\_\_ is not an example of a chemical reaction. 68) \_\_\_\_\_
- A) the rusting of iron
  - B) dissolution of a penny in nitric acid
  - C) the condensation of water vapor
  - D) the formation of polyethylene from ethylene
  - E) a burning candle
- 69) Gases and liquids share the property of \_\_\_\_\_. 69) \_\_\_\_\_
- A) indefinite shape
  - B) definite volume
  - C) definite shape
  - D) compressibility
  - E) incompressibility
- 70) Of the following, only \_\_\_\_\_ is a chemical reaction. 70) \_\_\_\_\_
- A) dissolving sugar in water
  - B) dropping a penny into a glass of water
  - C) tarnishing of silver
  - D) crushing of stone
  - E) melting of lead
- 71) Which one of the following is not an intensive property? 71) \_\_\_\_\_
- A) temperature
  - B) melting point
  - C) density
  - D) boiling point
  - E) mass
- 72) Which one of the following is an intensive property? 72) \_\_\_\_\_
- A) temperature
  - B) amount
  - C) heat content
  - D) mass
  - E) volume

- 73) Of the following, only \_\_\_\_\_ is an extensive property. 73) \_\_\_\_\_
- A) density
  - B) mass
  - C) temperature
  - D) freezing point
  - E) boiling point
- 74) Which of the following are chemical processes? 74) \_\_\_\_\_
1. rusting of a nail
  2. freezing of water
  3. decomposition of water into hydrogen and oxygen gases
  4. compression of oxygen gas
- A) 1, 3                  B) 1, 2                  C) 1, 3, 4                  D) 1, 4                  E) 2, 3, 4
- 75) Of the following, \_\_\_\_\_ is the smallest mass. 75) \_\_\_\_\_
- A)  $2.5 \times 10^{10}$  ng
  - B)  $2.5 \times 10^{-2}$  mg
  - C) 25 kg
  - D)  $2.5 \times 10^{15}$  pg
  - E)  $2.5 \times 10^9$  fg
- 76) Which one of the following is the highest temperature? 76) \_\_\_\_\_
- A) 96°F
  - B) 38°C
  - C) 302 K
  - D) none of the above
  - E) the freezing point of water
- 77) Which one of the following is true about the liter? 77) \_\_\_\_\_
- A) It is equivalent to a cubic decimeter.
  - B) It is slightly smaller than a gallon.
  - C) It is slightly smaller than a quart.
  - D) It contains  $10^6$  cubic centimeters.
  - E) It is the SI base unit for volume.

- 78) Of the objects below, \_\_\_\_\_ is the most dense. 78) \_\_\_\_\_
- A) an object with a volume of 139 mL and a mass of 93 g
  - B) an object with a volume of 2.5 L and a mass of 12.5 kg
  - C) an object with a volume of  $0.00212 \text{ m}^3$  and a mass of  $4.22 \times 10^4 \text{ mg}$
  - D) an object with a volume of  $13 \text{ dm}^3$  and a mass of  $1.29 \times 10^3 \text{ g}$
  - E) an object with a volume of  $3.91 \times 10^{-24} \text{ nm}^3$  and a mass of  $7.93 \times 10^{-1} \text{ ng}$
- 79) Which calculation clearly shows a conversion between temperatures in degrees Celsius,  $t(^{\circ}\text{C})$ , and temperature in Kelvins,  $T(\text{K})$ ? 79) \_\_\_\_\_
- A)  $T(\text{K}) = [t(^{\circ}\text{C}) - 32] / 1.8$
  - B)  $T(\text{K}) = t(^{\circ}\text{C}) + 273$
  - C)  $T(\text{K}) = t(^{\circ}\text{C})$
  - D)  $T(\text{K}) = 273 - t(^{\circ}\text{C})$
  - E)  $T(\text{K}) = [t(^{\circ}\text{C}) + 32] \times 1.8$
- 80) Express the temperature, 422.35 K, in degrees Celsius. 80) \_\_\_\_\_
- A)  $149.20^{\circ}\text{C}$
  - B)  $695.50^{\circ}\text{C}$
  - C)  $22.78^{\circ}\text{C}$
  - D)  $792.23^{\circ}\text{C}$
  - E)  $50.89^{\circ}\text{C}$
- 81) Which of the following liquids has the greatest density? 81) \_\_\_\_\_
- A)  $3.5 \text{ cm}^3$  with a mass of 10 g
  - B)  $0.022 \text{ cm}^3$  with a mass of 0.10 g
  - C)  $54 \text{ cm}^3$  with a mass of 45 g
  - D)  $13 \text{ cm}^3$  with a mass of 23 g
  - E)  $210 \text{ cm}^3$  with a mass of 12 g
- 82) You have to calculate the mass of a 30.0 mL liquid sample with density of 1.52 g/mL, but you have forgotten the formula. Which way of reasoning would help you in finding the correct mass? 82) \_\_\_\_\_
- A) If 1.52 mL of a liquid has the mass of 1 g, then 30.0 mL has the mass of \_\_\_\_\_ g.
  - B) If 1 mL of a liquid has the mass of 1.52 g, then 30.0 mL has the mass of \_\_\_\_\_ g.
- 83) You have to calculate the volume of a gas sample with mass of  $1.000 \times 10^3 \text{ g}$  and density of 1.027 g/L, but you have forgotten the formula. Which way of reasoning would help you in finding the correct mass? 83) \_\_\_\_\_
- A) If 1.027 L of gas has a mass of 1 g, then \_\_\_\_\_ L has the mass of  $1.000 \times 10^3 \text{ g}$ .
  - B) If 1.027 g of a gas takes up a volume of 1 L, then  $1.000 \times 10^3 \text{ g}$  of the same gas takes up a volume of \_\_\_\_\_.

- 84) Osmium has a density of  $22.6 \text{ g/cm}^3$ . What volume (in  $\text{cm}^3$ ) would be occupied by a 21.8 g sample of osmium? 84) \_\_\_\_\_
- A)  $2.03 \times 10^3$   
 B) 493  
 C)  $2.03 \times 10^{-3}$   
 D) 1.04  
 E) 0.965

- 85) A cube of an unknown metal measures 1.61 mm on one side. The mass of the cube is 36 mg. Which of the following is most likely the unknown metal? 85) \_\_\_\_\_

| Metal     | Density ( $\text{g/cm}^3$ ) |
|-----------|-----------------------------|
| rhodium   | 12.4                        |
| copper    | 8.96                        |
| niobium   | 8.57                        |
| vanadium  | 6.11                        |
| zirconium | 6.51                        |

- A) rhodium      B) niobium      C) zirconium      D) vanadium      E) copper

- 86) Precision refers to \_\_\_\_\_. 86) \_\_\_\_\_
- A) how close a measured number is to infinity  
 B) how close a measured number is to other measured numbers  
 C) how close a measured number is to the calculated value  
 D) how close a measured number is to zero  
 E) how close a measured number is to the true value

- 87) Accuracy refers to \_\_\_\_\_. 87) \_\_\_\_\_
- A) how close a measured number is to infinity  
 B) how close a measured number is to other measured numbers  
 C) how close a measured number is to the true value  
 D) how close a measured number is to the calculated value  
 E) how close a measured number is to zero

- 88) Which of the following has the same number of significant figures as the number 1.00310? 88) \_\_\_\_\_
- A)  $1 \times 10^6$       B) 5.119      C) 199.791      D) 100      E) 8.66

- 89) A wooden object has a mass of 10.782 g and occupies a volume of 13.72 mL. What is the density of the object determined to an appropriate number of significant figures? 89) \_\_\_\_\_
- A)  $8 \times 10^{-1}$  g/mL  
 B)  $7.9 \times 10^{-1}$  g/mL  
 C)  $7.86 \times 10^{-1}$  g/mL  
 D)  $7.859 \times 10^{-1}$  g/mL  
 E)  $7.8586 \times 10^{-1}$  g/mL
- 90) Acceleration due to gravity of a free-falling object is  $9.8 \text{ m/s}^2$ . Express this in millimeters/millisecond<sup>2</sup>. 90) \_\_\_\_\_
- A)  $9.8 \times 10^{-3}$       B)  $9.8 \times 10^{-9}$       C)  $9.8 \times 10^3$       D)  $9.8 \times 10^{-6}$       E)  $9.8 \times 10^6$
- 91) If an object is accelerating at a rate of  $25 \text{ m/s}^2$ , how long (in seconds) will it take to reach a speed of 550 m/s? (Assume an initial velocity of zero.) 91) \_\_\_\_\_
- A)  $1.2 \times 10^4$       B) 0.045      C)  $1.4 \times 10^4$       D)  $2.3 \times 10^2$       E) 22
- 92) If an object is accelerating at a rate of  $25 \text{ m/s}^2$ , how fast will it be moving (in m/s) after 1.50 min? (Assume an initial velocity of zero.) 92) \_\_\_\_\_
- A) 38      B) 3.6      C) 0.060      D)  $2.3 \times 10^3$       E) 17
- 93) Expressing a number in scientific notation \_\_\_\_\_. 93) \_\_\_\_\_
- A) removes ambiguity as to the significant figures  
 B) allows to increase the number's precision  
 C) changes its value  
 D) removes significant zeros  
 E) all of the above
- 94) The number with the most significant zeros is \_\_\_\_\_. 94) \_\_\_\_\_
- A) 0.02500001  
 B) 250000001  
 C)  $2.501 \times 10^{-7}$   
 D) 0.00002510  
 E) 2.5100000
- 95) How many significant figures should be retained in the result of the following calculation? 95) \_\_\_\_\_
- $12.00000 \times 0.9893 + 13.00335 \times 0.0107$
- A) 2      B) 3      C) 4      D) 5      E) 6

- 96) In which one of the following numbers are all of the zeros significant? 96) \_\_\_\_\_  
 A) 100.090090  
 B) 0.05843  
 C) 0.143290  
 D) 00.0030020  
 E) 0.1000
- 97) Round the number 0.007222 to three significant figures. 97) \_\_\_\_\_  
 A) 0.007225      B) 0.007      C) 0.0072      D) 0.00723      E) 0.00722
- 98) Round the number 0.08535 to two significant figures. 98) \_\_\_\_\_  
 A) 0.09      B) 0.086      C) 0.0854      D) 0.08535      E) 0.085
- 99) Which of the following is the same as 0.001 cm? 99) \_\_\_\_\_  
 A) 0.01 dm      B) 0.01 m      C) 100 mm      D) 1 mm      E) 0.01 mm
- 100) One angstrom, symbolized Å, is  $10^{-10}$  m.  $1 \text{ cm}^3 = \text{_____} \text{ Å}^3$ . 100) \_\_\_\_\_  
 A)  $10^{-30}$       B)  $10^{-9}$       C)  $10^{-24}$       D)  $10^{30}$       E)  $10^{24}$
- 101) What decimal power does the abbreviation f represent? 101) \_\_\_\_\_  
 A)  $1 \times 10^{-12}$       B)  $1 \times 10^3$       C)  $1 \times 10^{-15}$       D)  $1 \times 10^{-1}$       E)  $1 \times 10^6$
- 102) How many significant figures are in the measurement 5.34 g? 102) \_\_\_\_\_  
 A) 2      B) 5      C) 1      D) 3      E) 4
- 103) The width, length, and height of a large, custom-made shipping crate are 1.22 m, 3.22 m, and 0.83 m, respectively. The volume of the box using the correct number of significant figures is \_\_\_\_\_  $\text{m}^3$ . 103) \_\_\_\_\_  
 A) 3.2606      B) 3.26057      C) 3.3      D) 3.26      E) 3.261
- 104) The estimated costs for remodelling the interior of an apartment are: three 1-gallon cans of paint at \$13.22 each (including tax), two paint brushes at \$9.53 each (including tax), and \$135 for a helper. The total estimated cost with the appropriate significant figures is \$\_\_\_\_\_. 104) \_\_\_\_\_  
 A)  $1.9 \times 10^2$       B) 194      C) 193.72      D) 193.7      E)  $2 \times 10^2$



- 105) Round the following number to four significant figures and express the result in standard exponential notation: 229.613 105) \_\_\_\_\_
- A)  $2.296 \times 10^2$   
 B)  $0.2296 \times 10^3$   
 C)  $22.96 \times 10^{-1}$   
 D) 229.6  
 E)  $2.296 \times 10^{-2}$
- 106) How many liters of wine can be held in a wine barrel whose capacity is 26.0 gal? 106) \_\_\_\_\_  
 1 gal = 4 qt = 3.7854 L.
- A) 0.146  
 B) 98.4  
 C)  $1.46 \times 10^{-4}$   
 D)  $6.87 \times 10^3$   
 E) 6.87
- 107) The recommended adult dose of Elixophyllin®, a drug used to treat asthma, is 6.0 mg/kg of body mass. Calculate the dose in milligrams for a 115-lb person. 1 lb = 453.59 g. 107) \_\_\_\_\_
- A)  $3.1 \times 10^5$       B) 1,521      C) 24      D) 313      E) 1.5
- 108) The density of air under ordinary conditions at 25°C is 1.19 g/L. How many kilograms of air is in a room that measures 11.0 ft × 11.0 ft and has an 10.0 ft ceiling? 1 in. = 2.54 cm (exactly); 1 L =  $10^3 \text{ cm}^3$  108) \_\_\_\_\_
- A) 40.8      B) 0.152      C) 3.66      D)  $4.08 \times 10^4$       E) 0.0962
- 109) How many liters of air are in a room that measures 10.0 ft × 11.0 ft and has an 8.00 ft ceiling? 109) \_\_\_\_\_  
 1 in. = 2.54 cm (exactly); 1 L =  $10^3 \text{ cm}^3$
- A)  $2.68 \times 10^7$       B) 92.8      C)  $2.49 \times 10^4$       D) 26.8      E)  $8.84 \times 10^5$
- 110) What is the volume (in  $\text{cm}^3$ ) of a 63.4 g piece of metal with a density of 12.86 g/ $\text{cm}^3$ ? 110) \_\_\_\_\_
- A) 6.65  
 B) 19.5  
 C) 4.93  
 D) .425  
 E) none of the above

**SHORT ANSWER.** Write the word or phrase that best completes each statement or answers the question.

111) The correct answer (reported to the proper number of significant figures) to the following is \_\_\_\_\_ 111) \_\_\_\_\_

$$11.5 \times 8.78 = \underline{\hspace{2cm}}$$

112) The correct answer (reported to the proper number of significant figures) to the following is \_\_\_\_\_ 112) \_\_\_\_\_

$$(1815-1806) \times (9.11 \times 7.92) = \underline{\hspace{2cm}}$$

113) 38.325 lbs = \_\_\_\_\_ grams. 113) \_\_\_\_\_

Answer Key

Testname: SAMPLE TEST 1

- 1) E
- 2) B
- 3) E
- 4) B
- 5) E
- 6) D
- 7) A
- 8) E
- 9) D
- 10) E
- 11) C
- 12) E
- 13) C
- 14) A
- 15) E
- 16) B
- 17) B
- 18) A
- 19) C
- 20) D
- 21) B
- 22) A
- 23) D
- 24) D
- 25) A
- 26) B
- 27) C
- 28) A
- 29) B
- 30) A
- 31) A
- 32) C
- 33) E
- 34) A
- 35) A
- 36) B
- 37) B
- 38) A
- 39) C
- 40) E
- 41) E
- 42) B
- 43) B
- 44) B
- 45) D
- 46) E
- 47) E
- 48) B
- 49) C
- 50) B

Answer Key

Testname: SAMPLE TEST 1

- 51) E
- 52) E
- 53) D
- 54) D
- 55) B
- 56) D
- 57) D
- 58) E
- 59) D
- 60) A
- 61) E
- 62) E
- 63) A
- 64) A
- 65) D
- 66) D
- 67) A
- 68) C
- 69) A
- 70) C
- 71) E
- 72) A
- 73) B
- 74) A
- 75) E
- 76) B
- 77) A
- 78) E
- 79) B
- 80) A
- 81) B
- 82) B
- 83) B
- 84) E
- 85) B
- 86) B
- 87) C
- 88) C
- 89) D
- 90) A
- 91) E
- 92) D
- 93) A
- 94) B
- 95) C
- 96) A
- 97) E
- 98) E
- 99) E
- 100) E

Answer Key

Testname: SAMPLE TEST 1

- 101) C
- 102) D
- 103) C
- 104) B
- 105) A
- 106) B
- 107) D
- 108) A
- 109) C
- 110) C
- 111) 101
- 112) 600
- 113) 17400