Multiple Choice and Bimodal

1) Solids have a _____ shape and are not appreciably _____.
A) definite, compressible
B) definite, incompressible
C) indefinite, compressible
D) indefinite, incompressible
E) sharp, convertible
Answer: A
Diff: 1 Page Ref: Sec. 1.2

2) _____ is the chemical symbol for elemental sodium.
A) S
B) W
C) So
D) Na
E) Sn
Answer: D
Diff: 1 Page Ref: Sec. 1.2

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) _____.
A) heterogeneous mixture
B) element
C) homogeneous mixture
D) compound
E) mixture of elements
Answer: D
Diff: 4 Page Ref: Sec. 1.2

4) The symbol for the element potassium is _____.
A) Pt
B) P
C) K
D) S
E) Ca
Answer: C
Diff: 1 Page Ref:Sec. 1.2

5) The symbol for the element magnesium is _____.
A) Rb
B) Mn
C) Ne
D) Si
E) Mg
Answer: E
Diff: 1 Page Ref:Sec. 1.2

6) The initial or tentative explanation of an observation is called a(n) _____.
A) law
B) theory
C) hypothesis
D) experiment
E) test
Answer: C
Diff: 2 Page Ref:Sec. 1.3

7) A concise verbal statement or mathematical equation that summarizes a broad variety of observations and experiences is called a(n) _____.
A) law
B) theory
C) hypothesis
D) experiment
E) test
Answer: A
Diff: 2 Page Ref:Sec. 1.3

8) A separation process that depends on differing abilities of substances to form gases is called _____.
A) filtration
B) solvation
C) distillation
D) chromatography
E) all of the above are correct
Answer: C
Diff: 3 Page Ref:Sec. 1.3

9) The SI unit for mass is _____.
A) kilogram
B) gram
C) pound
D) troy ounce
E) none of the above
Answer: A
Diff: 1 Page Ref:Sec. 1.4

10) A one degree of temperature difference is the smallest on the _____ temperature scale.
A) Kelvin
B) Celsius
C) Fahrenheit
D) Kelvin and Celsius
E) Fahrenheit and Celsius
Answer: C
Diff: 3 Page Ref:Sec. 1.4

11) A common English set of units for expressing velocity is miles/hour. The SI unit for velocity is _____?
A) km/hr
B) km/s
C) m/hr
D) m/s
E) cm/s
Answer: D
Diff: 3 Page Ref:Sec. 1.4

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.

A) $\frac{\text{g} \cdot \text{cm}}{\text{s}^2}$

B) $\frac{\text{kg} \cdot \text{m}}{\text{hr}^2}$

C) $\frac{\text{kg} \cdot \text{m}}{\text{s}^2}$

D) $\frac{\text{g} \cdot \text{m}}{\text{s}^2}$

E) $\frac{\text{g} \cdot \text{cm}}{\text{s}}$

Answer: C
Diff: 4 Page Ref:Sec. 1.4

13) Momentum is defined as the product of mass and velocity. The SI unit for momentum is _____?

A) $\frac{\text{kg} \cdot \text{m}}{\text{s}}$

B) $\frac{\text{kg} \cdot \text{m}}{\text{hr}}$

C) $\frac{\text{g} \cdot \text{m}}{\text{s}}$

D) $\frac{\text{g} \cdot \text{km}}{\text{s}}$

E) $\frac{\text{kg} \cdot \text{km}}{\text{hr}}$

Answer: A
Diff: 4 Page Ref:Sec. 1.4

14) The SI unit of temperature is _____.
A) K
B) °C
C) °F
D) t
E) T
Answer: A
Diff: 2 Page Ref:Sec. 1.4

15) The temperature of 25°C is _____ in Kelvins.
A) 103
B) 138
C) 166
D) 248
E) 298
Answer: E
Diff: 1 Page Ref:Sec. 1.4

16) The freezing point of water at 1 atm pressure is _____.
A) 0°F
B) 0 K
C) 0°C
D) -273°C
E) -32°F
Answer: C
Diff: 2 Page Ref:Sec. 1.4

17) A temperature of 400 K is the same as _____°F.
A) 261
B) 286
C) 88
D) 103
E) 127
Answer: A
Diff: 2 Page Ref:Sec. 1.4

18) A temperature of _____ K is the same as 63°F.
A) 17
B) 276
C) 290
D) 29
E) 336
Answer: C
Diff: 2 Page Ref:Sec. 1.4

19) 1 nanometer = _____ picometers
A) 1000
B) 0.1
C) 0.01
D) 1
E) 10
Answer: A
Diff: 2 Page Ref:Sec. 1.4

20) 1 picometer = _____ centimeters
A) 1×10^{10}
B) 1×10^{-10}
C) 1×10^{8}
D) 1×10^{-8}
E) 1×10^{-12}
Answer: B
Diff: 2 Page Ref:Sec. 1.4

21) 1 kilogram = _____ milligrams
A) 1×10^{-6}
B) 1,000
C) 10,000
D) 1,000,000
E) none of the above
Answer: D
Diff: 2 Page Ref:Sec. 1.4

22) "Absolute zero" refers to _____.
A) 0 Kelvin
B) 0° Fahrenheit
C) 0° Celsius
D) °C + 9/5(°F - 32)
E) 273.15°C
Answer: A
Diff: 1 Page Ref:Sec. 1.4

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 _____ cm^3, then the sphere will sink in liquid mercury (density = 13.6 g/cm^3).
A) 0.723
B) 1.38
C) 134
D) 7.48
E) none of the above
Answer: A
Diff: 3 Page Ref:Sec. 1.4

24) The density (in g/cm^3) of a gold nugget that has a volume of 1.68 cm^3 and a mass of 32.4 g is _____.
A) 0.0519
B) 19.3
C) 54.4
D) 0.0184
E) 32.4
Answer: B
Diff: 1 Page Ref:Sec. 1.4

25) The density of silver is 10.5 g/cm^3. A piece of silver with a mass of 61.3 g would occupy a volume of _____ cm^3.
A) 0.171
B) 644
C) 10.5
D) 0.00155
E) 5.84
Answer: E
Diff: 2 Page Ref:Sec. 1.4

26) The density of silver is 10.5 g/cm^3. A piece of silver that occupies a volume of 23.6 cm^3 would have a mass of _____g.
A) 248
B) 0.445
C) 2.25
D) 112
E) 23.6
Answer: A
Diff: 2 Page Ref:Sec. 1.4

27) A certain liquid has a density of 2.67 g/cm^3. 1340 g of this liquid would occupy a volume of _____ L.

A) 1.99×10^{-3}
B) 50.2
C) 3.58
D) 35.8
E) 0.502
Answer: E
Diff: 2 Page Ref:Sec. 1.4

28) A certain liquid has a density of 2.67 g/cm^3. 30.5 mL of this liquid would have a mass of _____ Kg.

A) 81.4
B) 11.4
C) 0.0875
D) 0.0814
E) 0.0114
Answer: D
Diff: 2 Page Ref:Sec. 1.4

29) Osmium has a density of 22.6 g/cm^3. The mass of a block of osmium that measures 1.01 cm × 0.233 cm × 0.648 cm is _____ g.

A) 6.75×10^{-3}
B) 3.45
C) 148
D) 6.75×10^{3}
E) 34.5
Answer: B
Diff: 3 Page Ref:Sec. 1.4

30) 3.337 g/cm^3 = _____ kg/cm^3

A) 3.337×10^{-9}
B) 3.337×10^{-5}
C) 3337
D) 0.3337
E) 333.7
Answer: C
Diff: 2 Page Ref:Sec. 1.4

31) The number 0.00430 has _____ significant figures.

A) 2
B) 3
C) 5
D) 6
E) 4
Answer: B
Diff: 1 Page Ref:Sec. 1.4

32) The number 1.00430 has _____ significant figures.
A) 2
B) 3
C) 5
D) 6
E) 4
Answer: D
Diff: 1 Page Ref:Sec. 1.4

33) The correct answer (reported to the proper number of significant figures) to the following is _____.

6.3 × 3.25 = _____
A) 20.
B) 20.475
C) 20.48
D) 20.5
E) 21
Answer: A
Diff: 2 Page Ref:Sec. 1.4

34) One side of a cube measures 1.55 m. The volume of this cube is _____ cm^3.
A) 2.40×10^4
B) 3.72×10^6
C) 2.40
D) 3.72
E) 155
Answer: B
Diff: 4 Page Ref:Sec. 1.4

35) The length of the side of a cube (in cm) having a volume of 44.4 L is _____.
A) 875
B) 35.4
C) 6.66
D) 66.6
E) 0.354
Answer: B
Diff: 4 Page Ref:Sec. 1.4

36) 45 m/s = _____ km/hr
A) 2.7
B) 0.045
C) 1.6×10^2
D) 2.7×10^3
E) 1.6×10^5
Answer: C
Diff: 2 Page Ref:Sec. 1.4

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 m/s^2) is _____. (Assume that the rate of acceleration is constant.)

A) 1.6×10^5
B) 255
C) 193
D) 4.24
E) 1.53×10^4
Answer: D
Diff: 4 Page Ref:Sec. 1.4

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

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

A) 13
B) 13.3
C) 13.33
D) 13.332
E) none of the above
Answer: A
Diff: 2 Page Ref:Sec. 1.5

39) $\dfrac{(0.002843)(12.80184)}{0.00032}$ = _____

A) 113.73635
B) 113.736
C) 113.74
D) 113.7
E) 1.1×10^2
Answer: E
Diff: 3 Page Ref:Sec. 1.5

40) The correct result of the molecular mass calculation for H_2SO_4 is _____.

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

A) 98.08
B) 98.079
C) 98.074
D) 98.838
E) 98.84
Answer: B
Diff: 3 Page Ref:Sec. 1.5

41) The volume of a regular cylinder is $V = \pi r^2 h$. Using the value 3.1416 for the constant π, the volume $\left(cm^3\right)$ of a cylinder of radius 2.34 cm and height 19.91 cm expressed to the correct number of significant figures is _____.
A) 342.49471
B) 342.495
C) 342.49
D) 343
E) 342
Answer: E
Diff: 4 Page Ref:Sec. 1.5

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

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

A) 1
B) 2
C) 3
D) 4
E) 5
Answer: B
Diff: 1 Page Ref:Sec. 1.5

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

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

A) 1
B) 2
C) 3
D) 4
E) 5
Answer: B
Diff: 2 Page Ref:Sec. 1.5

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

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

A) 1
B) 2
C) 3
D) 4
E) 5
Answer: B
Diff: 2 Page Ref:Sec. 1.5

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.)

A) 3.84×10^5

B) 7.67×10^4

C) 867

D) 3.84×10^7

E) 2.91×10^6

Answer: D
Diff: 4 Page Ref:Sec. 1.6

46) The density of mercury is $13.6\ g/cm^3$. The density of mercury is _____ kg/m^3.

A) 1.36×10^{-2}

B) 1.36×10^4

C) 1.36×10^8

D) 1.36×10^{-5}

E) 1.36×10^{-4}

Answer: B
Diff: 4 Page Ref:Sec. 1.6

47) The quantity $1.0\ mg/cm^2$ is the same as $1.0 \times$ _____ kg/m^2.

A) 10^{-4}

B) 10^2

C) 10^{-6}

D) 10^{-2}

E) 10^4

Answer: D
Diff: 2 Page Ref:Sec. 1.6

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

A) 3000
B) 300
C) 0.003
D) 0.03
E) 30
Answer: A
Diff: 2 Page Ref:Sec. 1.6

49) There are _____ ng in a pg.

A) 0.001
B) 1000
C) 0.01
D) 100
E) 10
Answer: A
Diff: 2 Page Ref:Sec. 1.6

50) One edge of a cube is measured and found to be 13 cm. The volume of the cube in m^3 is _____.
A) 2.2×10^{-3}
B) 2.2×10^{-6}
C) 2.2
D) 2.2×10^{3}
E 2.2×10^{6}
Answer: A
Diff: 4 Page Ref:Sec. 1.6

51) The density of lead is 11.4 g/cm^3. The mass of a lead ball with a radius of 0.50 mm is _____ g. $\left(\text{Vsphere} = 4\pi r^3/3\right)$
A) 6.0
B) 4.6×10^{-2}
C) 4.6×10^{-5}
D) 6.0×10^{-3}
E) 4.6
Answer: D
Diff: 4 Page Ref:Sec. 1.6

Multiple-Choice

52) In the following list, only _____ is <u>not</u> an example of matter.
A) planets
B) light
C) dust
D) elemental phosphorus
E) table salt
Answer: B
Diff: 2 Page Ref:Sec. 1.1

53) What is the physical state in which matter has no specific shape but does have a specific volume?
A) gas
B) solid
C) liquid
D) salts
E) ice
Answer: C
Diff: 1 Page Ref:Sec. 1.2

54) The law of constant composition applies to _____.
A) solutions
B) heterogeneous mixtures
C) compounds
D) homogeneous mixtures
E) solids
Answer: C
Diff: 1 Page Ref:Sec. 1.2

55) A combination of sand, salt, and water is an example of a _____.
A) homogeneous mixture
B) heterogeneous mixture
C) compound
D) pure substance
E) solid
Answer: B
Diff: 1 Page Ref:Sec. 1.2

56) Which one of the following has the element name and symbol correctly matched?
A) P, potassium
B) C, copper
C) Mg, manganese
D) Ag, silver
E) Sn, silicon
Answer: D
Diff: 1 Page Ref:Sec. 1.2

57) Which one of the following has the element name and symbol correctly matched?
A) S, sodium
B) Tn, tin
C) Fe, iron
D) N, neon
E) B, bromine
Answer: C
Diff: 1 Page Ref:Sec. 1.2

58) Which one of the following elements has a symbol that is <u>not</u> derived from its foreign name?
A) tin
B) aluminum
C) mercury
D) copper
E) lead
Answer: B
Diff: 2 Page Ref:Sec. 1.2

59) Which one of the following is a pure substance?
A) concrete
B) wood
C) salt water
D) elemental copper
E) milk
Answer: D
Diff: 1 Page Ref:Sec. 1.2

60) Which one of the following is often easily separated into its components by simple techniques such as filtering or decanting?
A) heterogeneous mixture
B) compounds
C) homogeneous mixture
D) elements
E) solutions
Answer: A
Diff: 3 Page Ref:Sec. 1.2

61) Which states of matter are significantly compressible?
A) gases only
B) liquids only
C) solids only
D) liquids and gases
E) solids and liquids
Answer: A
Diff: 1 Page Ref:Sec. 1.2

62) For which of the following can the composition vary?
A) pure substance
B) element
C) both homogeneous and heterogeneous mixtures
D) homogeneous mixture
E) heterogeneous mixture
Answer: C
Diff: 2 Page Ref:Sec. 1.2

63) If matter is uniform throughout and cannot be separated into other substances by physical means, it is _____.
A) a compound
B) either an element or a compound
C) a homogeneous mixture
D) a heterogeneous mixture
E) an element
Answer: B
Diff: 2 Page Ref:Sec. 1.2

64) An element cannot _____.
A) be part of a heterogeneous mixture
B) be part of a homogeneous mixture
C) be separated into other substances by chemical means
D) interact with other elements to form compounds
E) be a pure substance
Answer: C
Diff: 2 Page Ref:Sec. 1.2

65) Homogeneous mixtures are also known as _____.
A) solids
B) compounds
C) elements
D) substances
E) solutions
Answer: E
Diff: 1 Page Ref:Sec. 1.2

66) The law of constant composition says _____.
A) that the composition of a compound is always the same
B) that all substances have the same composition
C) that the composition of an element is always the same
D) that the composition of a homogeneous mixture is always the same
E) that the composition of a heterogeneous mixture is always the same
Answer: A
Diff: 1 Page Ref:Sec. 1.2

67) Which of the following is an illustration of the law of constant composition?
A) Water boils at 100°C at 1 atm pressure.
B) Water is 11% hydrogen and 89% oxygen by mass.
C) Water can be separated into other substances by a chemical process.
D) Water and salt have different boiling points.
E) Water is a compound.
Answer: B
Diff: 4 Page Ref:Sec. 1.2

68) In the following list, only _____ is not an example of a chemical reaction.
A) dissolution of a penny in nitric acid
B) the condensation of water vapor
C) a burning candle
D) the formation of polyethylene from ethylene
E) the rusting of iron
Answer: B
Diff: 2 Page Ref:Sec. 1.3

69) Gases and liquids share the property of _____.
A) compressibility
B) definite volume
C) incompressibility
D) indefinite shape
E) definite shape
Answer: D
Diff: 1 Page Ref:Sec. 1.3

70) Of the following, only _____ is a chemical reaction.
A) melting of lead
B) dissolving sugar in water
C) tarnishing of silver
D) crushing of stone
E) dropping a penny into a glass of water
Answer: C
Diff: 1 Page Ref:Sec. 1.3

71) Which one of the following is not an intensive property?
A) density
B) temperature
C) melting point
D) mass
E) boiling point
Answer: D
Diff: 2 Page Ref:Sec. 1.3

72) Which one of the following is an intensive property?
A) mass
B) temperature
C) heat content
D) volume
E) amount
Answer: B
Diff: 2 Page Ref:Sec. 1.3

73) Of the following, only _____ is an extensive property.
A) density
B) mass
C) boiling point
D) freezing point
E) temperature
Answer: B
Diff: 2 Page Ref:Sec. 1.3

74) Which of the following are chemical processes?
1. rusting of a nail
2. freezing of water
3. decomposition of water into hydrogen and oxygen gases
4. compression of oxygen gas

A) 2, 3, 4
B) 1, 3, 4
C) 1, 3
D) 1, 2
E) 1, 4
Answer: C
Diff: 3 Page Ref:Sec. 1.3

75) Of the following, _____ is the smallest mass.
A) 25 kg
B) 2.5×10^{-2}mg
C) 2.5×10^{15}pg
D) 2.5×10^{9}fg
E) 2.5×10^{10}ng
Answer: D
Diff: 2 Page Ref:Sec. 1.4

76) Which one of the following is the highest temperature?
A) 38°C
B) 96°F
C) 302 K
D) none of the above
E) the freezing point of water
Answer: A
Diff: 3 Page Ref:Sec. 1.4

77) Which one of the following is true about the liter?
A) It is the SI base unit for volume.
B) It is equivalent to a cubic decimeter.
C) It is slightly smaller than a quart.
D) It contains 10^{6} cubic centimeters.
E) It is slightly smaller than a gallon.
Answer: B
Diff: 4 Page Ref:Sec. 1.4

78) Of the objects below, _____ is the most dense.
A) an object with a volume of 2.5 L and a mass of 12.5 kg
B) an object with a volume of 139 mL and a mass of 93 g
C) an object with a volume of 0.00212 m^3 and a mass of 4.22×10^4mg
D) an object with a volume of $3.91 \times 10^{-24}nm^3$ and a mass of 7.93×10^{-1}ng
E) an object with a volume of 13 dm^3 and a mass of 1.29×10^3g
Answer: D
Diff: 4 Page Ref:Sec. 1.4

79) Which calculation clearly shows a conversion between temperatures in degrees Celsius, t(°C), and temperature in Kelvins, T(K)?
A) T(K) = t(°C) + 273
B) T(K) = 273 - t(°C)
C) T(K) = [t(°C) - 32] / 1.8
D) T(K) = [t(°C) + 32] × 1.8
E) T(K) = t(°C)
Answer: A
Diff: 1 Page Ref:Sec. 1.4

80) Express the temperature, 422.35 K, in degrees Celsius.
A) 792.23°C
B) 149.20°C
C) 695.50°C
D) 50.89°C
E) 22.78°C
Answer: B
Diff: 2 Page Ref:Sec. 1.4

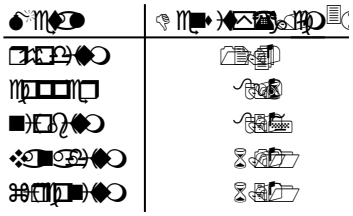
81) Which of the following liquids has the greatest density?
A) 13 cm^3 with a mass of 23 g
B) 3.5 cm^3 with a mass of 10 g
C) 0.022 cm^3 with a mass of 0.10 g
D) 54 cm^3 with a mass of 45 g
E) 210 cm^3 with a mass of 12 g
Answer: C
Diff: 2 Page Ref:Sec. 1.4

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?
A) If 1 mL of a liquid has the mass of 1.52 g, then 30.0 mL has the mass of _____ g.
B) If 1.52 mL of a liquid has the mass of 1 g, then 30.0 mL has the mass of _____ g.
Answer: A
Diff: 2 Page Ref:Sec. 1.4

83) You have to calculate the volume of a gas sample with mass of 1.000×10^3g 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?
A) If 1.027 g of a gas takes up a volume of 1 L, then 1.000×10^3g of the same gas takes up a volume of _____.
B) If 1.027 L of gas has a mass of 1 g, then _____ L has the mass of 1.000×10^3g .
Answer: A
Diff: 2 Page Ref:Sec. 1.4

84) Osmium has a density of 22.6 g/cm^3. What volume (in cm^3) would be occupied by a 21.8 g sample of osmium?
A) 0.965
B) 1.04
C) 493
D) 2.03×10^{-3}
E) 2.03×10^{3}
Answer: A
Diff: 1 Page Ref:Sec. 1.4

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?



A) copper
B) rhodium
C) niobium
D) vanadium
E) zirconium
Answer: C
Diff: 3 Page Ref:Sec. 1.4

86) Precision refers to _____.
A) how close a measured number is to other measured numbers
B) how close a measured number is to the true value
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 infinity
Answer: A
Diff: 1 Page Ref:Sec. 1.4

87) Accuracy refers to _____.
A) how close a measured number is to zero
B) how close a measured number is to the calculated value
C) how close a measured number is to other measured numbers
D) how close a measured number is to the true value
E) how close a measured number is to infinity
Answer: D
Diff: 1 Page Ref:Sec. 1.4

88) Which of the following has the same number of significant figures as the number 1.00310?
A) 1×10^{6}
B) 199.791
C) 8.66
D) 5.119
E) 100
Answer: B
Diff: 2 Page Ref:Sec. 1.4

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?
A) 8×10^{-1}g/mL
B) 7.9×10^{-1}g/mL
C) 7.86×10^{-1}g/mL
D) 7.859×10^{-1}g/mL
E) 7.8586×10^{-1}g/mL
Answer: D
Diff: 2 Page Ref:Sec. 1.4, 1.5

90) Acceleration due to gravity of a free-falling object is $9.8\ m/s^2$. Express this in millimeters/millisecond2.
A) 9.8×10^{-9}
B) 9.8×10^{3}
C) 9.8×10^{-6}
D) 9.8×10^{6}
E) 9.8×10^{-3}
Answer: E
Diff: 2 Page Ref:Sec. 1.4

91) If an object is accelerating at a rate of $25\ m/s^2$, how long (in seconds) will it take to reach a speed of 550 m/s? (Assume an initial velocity of zero.)
A) 22
B) 1.4×10^{4}
C) 0.045
D) 1.2×10^{4}
E) 2.3×10^{2}
Answer: A
Diff: 4 Page Ref:Sec. 1.4

92) If an object is accelerating at a rate of $25\ m/s^2$, how fast will it be moving (in m/s) after 1.50 min? (Assume an initial velocity of zero.)
A) 17
B) 3.6
C) 38
D) 2.3×10^{3}
E) 0.060
Answer: D
Diff: 4 Page Ref:Sec. 1.4

93) Expressing a number in scientific notation _____.
A) changes its value
B) removes ambiguity as to the significant figures
C) removes significant zeros
D) allows to increase the number's precision
E) all of the above
Answer: B
Diff: 2 Page Ref:Sec. 1.5

94) The number with the most significant zeros is _____.
A) 0.00002510
B) 0.02500001
C) 250000001
D) 2.501×10^{-7}
E) 2.5100000
Answer: C
Diff: 1 Page Ref:Sec. 1.5

95) How many significant figures should be retained in the result of the following calculation?

$$12.00000 \times 0.9893 + 13.00335 \times 0.0107$$

A) 2
B) 3
C) 4
D) 5
E) 6
Answer: C
Diff: 2 Page Ref:Sec. 1.5

96) In which one of the following numbers are <u>all</u> of the zeros significant?
A) 100.090090
B) 0.143290
C) 0.05843
D) 0.1000
E) 00.0030020
Answer: A
Diff: 1 Page Ref:Sec. 1.5

97) Round the number 0.007222 to three significant figures.
A) 0.007
B) 0.00722
C) 0.0072
D) 0.00723
E) 0.007225
Answer: B
Diff: 1 Page Ref:Sec. 1.5

98) Round the number 0.08535 to two significant figures.
A) 0.09
B) 0.086
C) 0.0854
D) 0.085
E) 0.08535
Answer: D
Diff: 1 Page Ref:Sec. 1.5

99) Which of the following is the same as 0.001 cm?
A) 0.01 mm
B) 0.01 dm
C) 0.01 m
D) 100 mm
E) 1 mm
Answer: A
Diff: 1 Page Ref:Sec. 1.6

100) One angstrom, symbolized Å, is 10^{-10}m. 1 cm^3 = _____ $Å^3$.
A) 10^{24}
B) 10^{-24}
C) 10^{30}
D) 10^{-30}
E) 10^{-9}
Answer: A
Diff: 3 Page Ref:Sec. 1.6

SHORT ANSWER.

1) Gases do not have a fixed _____ as they are able to be _____.
Answer: volume, compressed
Diff: 1 Page Ref:Sec. 1.2

2) The symbol for the element phosphorous is _____.
Answer: P
Diff: 1 Page Ref:Sec. 1.2

3) Sn is the symbol for the element _____.
Answer: Tin
Diff: 1 Page Ref:Sec. 1.2

4) Mass and volume are often referred to as _____ properties of substances.
Answer: extensive
Diff: 4 Page Ref:Sec. 1.3

5) 1 milligram = _____ micrograms
Answer: 1,000
Diff: 1 Page Ref:Sec. 1.4

6) 1.035×10^{-4}L = _____ mL
Answer: 0.1035
Diff: 1 Page Ref:Sec. 1.4

TRUE/FALSE.
1) Water is considered to be a diatomic molecule because it is composed of two different atoms.
Answer: FALSE
Diff: 1 Page Ref:Sec. 1.2

2) 3.2 cm^3 = 0.0032 L
Answer: TRUE
Diff: 2 Page Ref:Sec. 1.4

3) There are 6 significant figures in the number 0.003702
Answer: FALSE
Diff: 2 Page Ref:Sec. 1.4

4) A scientific theory is a concise statement or an equation that summarizes a broad variety of observations.
Answer: FALSE
Diff: 2 Page Ref:Sec. 1.4

5) Temperature is a physical property that determines the direction of heat flow.
Answer: TRUE
Diff: 3 Page Ref:Sec. 1.4

Algorithmic Questions

1) What decimal power does the abbreviation f represent?
A) 1×10^{6}
B) 1×10^{3}
C) 1×10^{-1}
D) 1×10^{-15}
E) 1×10^{-12}
Answer: D
Diff: 2 Page Ref:Sec. 1.4

2) What decimal power does the abbreviation Milli represent?
A) 1×10^{3}
B) 1×10^{6}
C) 1×10^{9}
D) 1×10^{-3}
E) 1×10^{-6}
Answer: D
Diff: 1 Page Ref:Sec. 1.4

3) How many significant figures are in the measurement 5.34 g?
A) 1
B) 2
C) 4
D) 3
E) 5
Answer: D
Diff: 1 Page Ref:Sec. 1.5

4) 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 _____ m^3.
A) 3.26057
B) 3.3
C) 3.26
D) 3.261
E) 3.2606
Answer: B
Diff: 2 Page Ref:Sec. 1.5

5) 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 $_____.
A) 193.72
B) 1.9×10^2
C) 194
D) 2×10^2
E) 193.7
Answer: C
Diff: 3 Page Ref:Sec. 1.5

6) Round the following number to four significant figures and express the result in standard exponential notation:
229.613
A) 0.2296×10^3
B) 229.6
C) 2.296×10^{-2}
D) 2.296×10^2
E) 22.96×10^{-1}
Answer: D
Diff: 2 Page Ref:Sec. 1.5

7) How many liters of wine can be held in a wine barrel whose capacity is 26.0 gal? 1 gal = 4 qt = 3.7854 L.
A) 1.46×10^{-4}
B) 0.146
C) 98.4
D) 6.87×10^3
E) 6.87
Answer: C
Diff: 3 Page Ref:Sec. 1.6

8) 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.
A) 24
B) 1,521
C) 1.5
D) 313
E) 3.1×10^5
Answer: D
Diff: 3 Page Ref:Sec. 1.6

9) 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 = $10^3 cm^3$
A) 3.66
B) 0.152
C) 4.08×10^4
D) 0.0962
E) 40.8
Answer: E
Diff: 3 Page Ref:Sec. 1.6

10) How many liters of air are in a room that measures 10.0 ft × 11.0 ft and has an 8.00 ft ceiling?
1 in. = 2.54 cm (exactly); 1 L = 10^3cm^3
A) 2.49×10^4
B) 92.8
C) 26.8
D) 2.68×10^7
E) 8.84×10^5
Answer: A
Diff: 3 Page Ref:Sec. 1.6

11) What is the volume (in cm^3) of a 63.4 g piece of metal with a density of 12.86 g/cm^3?
A) 4.93
B) 19.5
C) .425
D) 6.65
E) none of the above
Answer: A
Diff: 2 Page Ref:Sec. 1.4

12) The correct answer (reported to the proper number of significant figures) to the following is _____.

11.5 × 8.78 = _____

Answer: 101
Diff: 2 Page Ref:Sec. 1.4

13) The correct answer (reported to the proper number of significant figures) to the following is _____.

(1815 - 1806) × (9.11 × 7.92) = _____

Answer: 600
Diff: 4 Page Ref:Sec. 1.4

14) 38.325 lbs = _____ grams.
Answer: 17400
Diff: 4 Page Ref:Sec 1.4, 1.5