***Fundamentals of General, Organic, and Biological Chemistry, 8e* (McMurry)**

**Chapter 1 Matter and Measurements**

1) Which of the following is a chemical property?

A) melting point

B) mass

C) flammability

D) volume

E) temperature

Answer: C

Diff: 1

Section: 1.1

LO: 1.1

Global LO: G2

2) All of the following are examples of matter **except**

A) heat.

B) air.

C) water.

D) salt.

E) plants.

Answer: A

Diff: 1

Section: 1.1

LO: 1.1

Global LO: G2

3) Which of the following is a physical property?

A) flammability

B) conductivity

C) ability to support combustion

D) corrosiveness

E) inertness

Answer: B

Diff: 1

Section: 1.1

LO: 1.1

Global LO: G2

4) Which of the following is a chemical property of aspirin?

A) It does not decompose when protected from moisture.

B) It does not readily dissolve in water.

C) It can be compressed into tablets when mixed with cornstarch.

D) It melts at 135°C.

E) It is a white crystalline solid in pure form at room temperature.

Answer: A

Diff: 1

Section: 1.1

LO: 1.1

Global LO: G2

5) Which of the following is a physical change?

A) the rusting of iron

B) the condensation of water vapor

C) the baking of a potato

D) the explosion of nitroglycerin

E) all of the above

Answer: B

Diff: 1

Section: 1.1

LO: 1.3

Global LO: G2

6) Which statement describes a physical change?

A) winding an alarm clock

B) turning on a flashlight

C) digesting your lunch

D) burning the morning toast

E) lighting a match

Answer: A

Diff: 1

Section: 1.1

LO: 1.1

Global LO: G2

7) Which of the following causes a chemical change?

A) winding an alarm clock

B) metabolizing fat

C) slicing a tomato

D) digging a hole

E) pumping gasoline

Answer: B

Diff: 2

Section: 1.1

LO: 1.1

Global LO: G2

8) A chemist is given an unknown gas sample. Which observation describes a chemical property of the sample?

A) It extinguishes a glowing splint.

B) It has a sharp, stinging odor.

C) It is colorless.

D) Its density is greater than that of air.

E) It weighs 11.2 grams.

Answer: A

Diff: 2

Section: 1.1

LO: 1.1

Global LO: G1

9) A chemist is given an unknown sample. Which of her observations is **not** a physical property?

A) The sample is a colorless liquid.

B) The sample has an odor similar to gasoline.

C) The sample is flammable.

D) The sample size is 55 mL.

E) The density of the liquid is 0.789 g/mL.

Answer: C

Diff: 2

Section: 1.1

LO: 1.1

Global LO: G1

10) Which of the following is a **physical** property of aspirin?

A) Aspirin can moderate some heart disorders when ingested.

B) Aspirin does not decompose when tightly sealed in a bottle.

C) Aspirin yields carbon dioxide and water vapor when burned.

D) Aspirin can be pressed into tablets when mixed with cornstarch.

E) Aspirin reacts with water to produce salicylic acid and acetic acid.

Answer: D

Diff: 3

Section: 1.1

LO: 1.1

Global LO: G1

11) Which of the following is an example of matter?

A) light

B) clothing

C) forgiveness

D) jealousy

E) wisdom

Answer: B

Diff: 1

Section: 1.2

LO: 1.2

Global LO: G2

12) Which is an example of matter?

A) electrical current

B) conductivity

C) reactivity

D) plastic

E) anxiety

Answer: D

Diff: 1

Section: 1.2

LO: 1.2

Global LO: G2

13) Which best describes the size and shape of a sample of gas?

A) It has definite volume and definite shape.

B) It has definite volume, but shape is determined by the container.

C) Its volume is determined by the container, but it has a definite shape.

D) Volume and shape are both determined by the container.

E) Volume and shape cannot be described.

Answer: D

Diff: 1

Section: 1.2

LO: 1.2

Global LO: G1

14) Which term does **not** describe a conversion between states of matter?

A) condensation

B) evaporation

C) freezing

D) melting

E) mixing

Answer: E

Diff: 1

Section: 1.2

LO: 1.2

Global LO: G2

15) 1-butanethiol, one of the compounds giving skunks their distinctive odor, freezes at -115.7°C and boils at 98.5°C. What is its phase at 37°C, the normal body temperature of humans?

A) solid

B) liquid

C) gas

D) a mixture of solid and liquid

E) a mixture of liquid and gas

Answer: B

Diff: 3

Section: 1.2

LO: 1.2

Global LO: G9

16) Malic acid, a compound used to increase the acidity of fruit-flavored products, freezes at 128°C and boils at 150°C. What is its phase at 100°C, a temperature used in food processing applications?

A) solid

B) liquid

C) gas

D) a mixture of solid and liquid

E) a mixture of liquid and gas

Answer: A

Diff: 3

Section: 1.2

LO: 1.2

Global LO: G9

17) Which factor determines the state of matter in which a substance exists?

A) amount

B) color

C) density

D) odor

E) temperature

Answer: E

Diff: 3

Section: 1.2

LO: 1.2

Global LO: G2

18) Which of the following are states of matter?

A) solid

B) suspension

C) solution

D) precipitate

E) all of the above

Answer: A

Diff: 1

Section: 1.2

LO: 1.2

Global LO: G2

19) Barium sulfate is described as a white crystalline solid that melts at 1580°C and decomposes at 1600°C. At a temperature of 500°C, you would expect a sample of barium sulfate to be a

A) colorless liquid.

B) white crystalline solid.

C) yellow liquid.

D) white cloud of vapor.

E) form that cannot be determined.

Answer: B

Diff: 3

Section: 1.2

LO: 1.2

Global LO: G9

20) Which of the following is a pure substance?

A) root beer

B) bleach

C) eggs

D) gasoline

E) neon

Answer: E

Diff: 1

Section: 1.3

LO: 1.3

Global LO: G1

21) Which of the following observations demonstrates that a solid sample is a **compound**?

A) It cannot be broken down into simpler substances by chemical methods.

B) It cannot be broken down into simpler substances by physical methods.

C) Heating the substance causes it to melt, then to boil.

D) Heating the substance causes no visible color change.

E) Crushing the sample does not affect its other properties.

Answer: B

Diff: 1

Section: 1.3

LO: 1.3

Global LO: G1

22) A pure substance

A) always has the same elemental composition.

B) is composed of more than one element.

C) can be broken into its components by physical means.

D) is chemically inert.

E) changes color when placed in bright sunlight.

Answer: A

Diff: 1

Section: 1.3

LO: 1.3

Global LO: G1

23) Which of the following is a mixture?

A) cough syrup

B) iron

C) helium

D) sodium hydrogen carbonate

E) steam

Answer: A

Diff: 2

Section: 1.3

LO: 1.3

Global LO: G1

24) Which of the following can be classified as a pure compound?

A) alcohol in water, OH in O

B) sugar, 

C) carbon, C

D) iodine, 

E) Sulfur, S8

Answer: B

Diff: 2

Section: 1.3

LO: 1.3

Global LO: G1

25) List and describe two differences between pure substances and mixtures.

Answer: 1. The composition of a pure substance is always the same, regardless of the source, but the composition of a mixture can vary.

2. Mixtures can be separated into their components by physical changes; some pure substances can be separated into components by chemical change.

Diff: 1

Section: 1.3

LO: 1.3

Global LO: G1

26) Vegetable oil is a(an) \_\_\_\_\_\_\_\_, and is found in the \_\_\_\_\_\_\_\_ phase.

A) element; liquid

B) compound; solid

C) mixture; liquid

D) compound; gas

E) mixture; solid

Answer: C

Diff: 2

Section: 1.3

LO: 1.3

Global LO: G1

27) A reddish powder is heated gently in a loosely covered container. After the heating a silvery metal remains in the container, and a glowing wooden splint placed into the container bursts into flame. The original substance is a(an) \_\_\_\_\_\_\_\_, and the solid and gas produced are \_\_\_\_\_\_\_\_.

A) element; compounds

B) compound; elements

C) mixture; compounds

D) compound; compounds

E) mixture; elements

Answer: B

Diff: 3

Section: 1.3

LO: 1.3

Global LO: G1

28) Each symbol denotes an element **except**

A) Co.

B) CO.

C) Cu.

D) C.

E) Cl.

Answer: B

Diff: 1

Section: 1.4

LO: 1.4

Global LO: G1

29) Which of the following is an element?

A) fire

B) iron

C) salt

D) water

E) wine

Answer: B

Diff: 1

Section: 1.4

LO: 1.4

Global LO: G1

30) What is the chemical symbol for chlorine?

A) C

B) Ca

C) Cl

D) Cr

E) Cu

Answer: C

Diff: 1

Section: 1.4

LO: 1.4

Global LO: G2

31) What is the chemical symbol for calcium?

A) C

B) Ca

C) Cl

D) Cr

E) Cu

Answer: B

Diff: 1

Section: 1.4

LO: 1.4

Global LO: G2

32) The most common element by mass percent in the human body is

A) carbon.

B) hydrogen.

C) oxygen

D) sulfur.

E) phosphorus.

Answer: C

Diff: 1

Section: 1.4

LO: 1.4

Global LO: G2

33) Xylene, a compound with the formula C8H10, is composed of

A) any combination of atoms of carbon and hydrogen in a four to five ratio.

B) eight atoms of carbon and ten atoms of hydrogen.

C) eight atoms of calcium and ten atoms of helium.

D) ten atoms of carbon and eight atoms of hydrogen.

E) any combination of atoms of carbon and hydrogen that add up to 18 total.

Answer: B

Diff: 1

Section: 1.4

LO: 1.4

Global LO: G2

34) Which symbol does **not** denote a compound?

A) 

B) 

C) 

D) Cr

E) Ca

Answer: D

Diff: 1

Section: 1.4

LO: 1.4

Global LO: G2

35) Which element is **not** essential for human life?

A) C

B) H

C) P

D) Pb

E) Ca

Answer: D

Diff: 1

Section: 1.4

LO: 1.4

Global LO: G2

36) What is the symbol for tungsten?

A) W

B) Tu

C) Sn

D) St

E) Ti

Answer: A

Diff: 1

Section: 1.4

LO: 1.4

Global LO: G2

37) What element is represented by the chemical symbol K?

A) kaolin

B) phosphorus

C) potassium

D) silver

E) sodium

Answer: C

Diff: 2

Section: 1.4

LO: 1.4

Global LO: G2

38) **Of the elements listed**, the most abundant by mass percent in the earth's crust is

A) silicon.

B) aluminum.

C) hydrogen.

D) iron.

E) sodium.

Answer: A

Diff: 2

Section: 1.4

LO: 1.4

Global LO: G2

39) The formula for ammonia, , represents a compound composed of

A) one atom of nickel and three atoms of hydrogen.

B) one atom of nitrogen and three atoms of hydrogen.

C) three atoms of nitrogen and three atoms of hydrogen.

D) three atoms of nitrogen and one atom of hydrogen.

E) one atom of nitrogen and three atoms of helium.

Answer: B

Diff: 2

Section: 1.4

LO: 1.4

Global LO: G4

40) The formula for sodium carbonate, , represents a compound composed of

A) two atoms of sodium, three atoms of carbon, and three atoms of oxygen.

B) two atoms of sodium, one atom of carbon, and three atoms of oxygen.

C) six atoms of sodium, two atoms of carbon, and six atoms of oxygen.

D) one atom of sodium and one atom of carbonate.

E) two atoms of sodium and three atoms of carbonate.

Answer: B

Diff: 2

Section: 1.4

LO: 1.4

Global LO: G4

41) The formula for glucose, C6H12O6, represents a compound composed of

A) six atoms of carbon, twelve atoms of hydrogen, and six atoms of oxygen.

B) six atoms of carbon, ten atoms of hydrogen, and four atoms of oxygen.

C) one atom of carbon, two atoms of hydrogen, and one atom of oxygen.

D) six atoms of carbon and six atoms of water.

E) six atoms of carbon and two atoms of water.

Answer: A

Diff: 2

Section: 1.4

LO: 1.4

Global LO: G4

42) Amphetamine, a commonly abused drug, is composed of nine atoms of carbon, 13 atoms of hydrogen, and one atom of nitrogen. The chemical formula of amphetamine is written

A) C9H13N1.

B) C9H13.

C) C9H13N.

D) C13H93N0.

E) C9H1N13.

Answer: C

Diff: 3

Section: 1.4

LO: 1.4

Global LO: G4

43) Caffeine, the active ingredient in coffee, is composed of eight atoms of carbon, ten atoms of hydrogen, and four atoms of nitrogen, and two atoms of oxygen. The chemical formula of caffeine is written

A) CHNO

B) C8H10N4O2

C) C8H10N4

D) C8H12N4O4

E) C8H10N4O

Answer: B

Diff: 3

Section: 1.4

LO: 1.4

Global LO: G4

44) Consider the chemical reaction described as

 mercury(II) oxide  mercury + oxygen.

Identify the reactant(s) in this example.

A) heat

B) mercury + oxygen

C) mercury(II) oxide

D) mercury

E) oxygen

Answer: C

Diff: 2

Section: 1.5

LO: 1.5

Global LO: G2

45) Identify the product(s) in the following reaction:

 calcium carbonate → calcium oxide + carbon dioxide

A) calcium carbonate

B) calcium oxide + carbon dioxide

C) calcium carbonate + calcium oxide

D) carbon dioxide + calcium carbonate

E) calcium carbonate + calcium oxide + carbon dioxide

Answer: B

Diff: 2

Section: 1.5

LO: 1.5

Global LO: G2

46) Which of the following is an indication that a chemical reaction has taken place?

A) change in color

B) production of a gas

C) release of heat

D) formation of a solid

E) all of the above

Answer: E

Diff: 2

Section: 1.5

LO: 1.5

Global LO: G2

47) When the prefix *milli* is used in the metric or SI system, a fundamental unit of measurement is multiplied by what factor?

A) 

B) 

C) 

D) 

E) 

Answer: A

Diff: 2

Section: 1.6

LO: 1.7

Global LO: G4

48) The number 5.320 ×  in conventional notation is

A) 532.0.

B) 53.20.

C) 5.320.

D) 0.5320.

E) 0.005320.

Answer: A

Diff: 1

Section: 1.6

LO: 1.6

Global LO: G4

49) In scientific notation, the number 185,000,000 is

A) 185 × .

B) 1.85 × .

C) 1.85 × .

D) 185 × .

E) 1.85 × .

Answer: C

Diff: 2

Section: 1.6

LO: 1.6

Global LO: G4

50) In scientific notation, the number 0.0046 is expressed as

A) 46 × .

B) 4.6 × .

C) 4.6 × .

D) 4.6 × .

E) 46 × .

Answer: B

Diff: 2

Section: 1.6

LO: 1.6

Global LO: G4

51) What is 2.1 ×  written in decimal notation?

A) 2,100,000

B) 210,000

C) 210

D) 0.000 21

E) 0.000 021

Answer: E

Diff: 2

Section: 1.6

LO: 1.6

Global LO: G4

52) What is 0.0970 written in scientific notation?

A) 970 × 

B) 97 × 

C) 9.70 × 

D) 97.0 × 

E) 0.97 × 

Answer: C

Diff: 2

Section: 1.6

LO: 1.6

Global LO: G4

53) When the prefix *centi* is used in the metric system, a fundamental unit of measurement is multiplied by what factor?

A) 

B) 

C) 

D) 

E) 

Answer: B

Diff: 2

Section: 1.6

LO: 1.6

Global LO: G4

54) How many meters are there in one kilometer?

A) 

B) 

C) 

D) 

E) 

Answer: D

Diff: 2

Section: 1.6

LO: 1.6

Global LO: G4

55) How long is 1 cm?

A) 0.01 mm

B) 1 mm

C) 10 mm

D) 100 mm

E) 1000 mm

Answer: C

Diff: 3

Section: 1.6

LO: 1.6

Global LO: G4

56) Which value is closest to the mass of a 2-pound box of laundry detergent?

A) 200 g

B) 2.0 × 10-4 cg

C) 9 × 109 mg

D) 1 kg

E) 4.5 × 103 ng

Answer: D

Diff: 3

Section: 1.6

LO: 1.7

Global LO: G4

57) The abbreviation for the metric unit used to measure mass is

A) g

B) g/cm3

C) K

D) L

E) m

Answer: A

Diff: 1

Section: 1.7

LO: 1.7

Global LO: G4

58) A student weighed a solid sample. The units for this measurement are most likely to be recorded as

A) grams.

B) grams per cubic centimeter.

C) Kelvins.

D) liters.

E) meters.

Answer: A

Diff: 1

Section: 1.7

LO: 1.7

Global LO: G4

59) The amount of matter in an object is its

A) density.

B) mass.

C) specific gravity.

D) volume.

E) weight.

Answer: B

Diff: 2

Section: 1.7

LO: 1.7

Global LO: G4

60) The measurement most likely to describe the amount of pain reliever in a headache tablet is

A) 1.5 kg.

B) 500 mg.

C) 1.00 mL.

D) 325 mg/mL.

E) 0.25 L.

Answer: B

Diff: 2

Section: 1.7

LO: 1.7

Global LO: G4

61) Which measurement represents the **largest** quantity?

A) 4730 ng

B) 4.73 × 10-4 g

C) 4.73 × 103 μg

D) 4.73 × 10-6 kg

E) 47.3 mg

Answer: E

Diff: 3

Section: 1.7

LO: 1.7

Global LO: G4

62) Which measurement represents the **smallest** quantity?

A) 2950 ng

B) 2.95 × 10-4 g

C) 2.95 × 103 μg

D) 2.95 × 10-6 kg

E) 29.5 mg

Answer: A

Diff: 3

Section: 1.7

LO: 1.7

Global LO: G4

63) The metric unit used to measure volume is the

A) gram.

B) gram per cubic centimeter.

C) Kelvin.

D) liter.

E) meter.

Answer: D

Diff: 1

Section: 1.7

LO: 1.7

Global LO: G4

64) Which of the following represents the **largest** unit?

A) deciliter

B) dekaliter

C) kiloliter

D) megaliter

E) milliliter

Answer: D

Diff: 2

Section: 1.7

LO: 1.7

Global LO: G4

65) The units most likely to be used to measure the amount of alcohol to be added to a small test tube are

A) g.

B) mL.

C) cm.

D) kg.

E) L.

Answer: B

Diff: 2

Section: 1.7

LO: 1.7

Global LO: G4

66) In an introductory laboratory exercise, a student was asked to measure the volume of soda in a partially filled can in metric units. Which value below is most likely to be correct?

A) 1.0 kL

B) 2.5 L

C) 325 mL

D) 550 μL

E) 6.0 ×  nL

Answer: C

Diff: 2

Section: 1.7

LO: 1.7

Global LO: G4

67) The SI unit for volume is \_\_\_\_\_\_\_\_ and the metric unit for volume is \_\_\_\_\_\_\_\_.

A) cc; L

B) L; m3

C) m3; L

D) mL; cc

E) m3; cm3

Answer: C

Diff: 3

Section: 1.7

LO: 1.7

Global LO: G4

68) Which value is closest to the amount of gasoline in a small car with a full tank (which contains about 13 gallons)?

A) 450 mL

B) 50 L

C) 85 μL

D) 12 kL

E) 3.5 × 102 dL

Answer: B

Diff: 3

Section: 1.7

LO: 1.7

Global LO: G4

69) 125 cL is the same as all of these **except**

A) 125 centiliter.

B) 125 cubic liter.

C) 1.25 liter.

D) 1250 milliliter.

E) 12.5 deciliter.

Answer: B

Diff: 3

Section: 1.7

LO: 1.7

Global LO: G4

70) Which of the following measurements has three significant figures?

A) 1207 g

B) 4.250 g

C) 0.006 g

D) 0.0250 g

E) 0.03750 g

Answer: D

Diff: 1

Section: 1.8

LO: 1.8

Global LO: G4

71) What is the numerical value of 1.2 × 1.222? Express your answer using the correct number of significant figures.

A) 1.5

B) 1.47

C) 1.466

D) 1.4664

E) none of the above

Answer: A

Diff: 1

Section: 1.8

LO: 1.8

Global LO: G4

72) A laboratory technician reports that the mass of a growth removed from a patient is 274.06 g. How many significant figures does this measurement contain?

A) 2

B) 3

C) 4

D) 5

E) none of the above

Answer: D

Diff: 2

Section: 1.8

LO: 1.8

Global LO: G4

73) Which of the following numbers contains **four** significant figures?

A) 230,110

B) 23,011.0

C) 0.23010

D) 0.0230100

E) 0.002301

Answer: E

Diff: 2

Section: 1.8

LO: 1.8

Global LO: G4

74) Which of the following numbers contains **five** significant figures?

A) 0.04910

B) 0.4910

C) 4.9100

D) 49,100

E) 4,910,000

Answer: C

Diff: 2

Section: 1.8

LO: 1.8

Global LO: G4

75) Which choice best describes the degree of uncertainty in the measurement 16.30 g?

A) The uncertainty cannot be determined without additional information.

B) The quantity is exact.

C) ±1.00 g

D) ±0.10 g

E) ±0.01 g

Answer: E

Diff: 3

Section: 1.8

LO: 1.8

Global LO: G4

76) Which choice best describes the degree of uncertainty in the measurement 4.0032 g?

A) The uncertainty cannot be determined without additional information.

B) The quantity is exact.

C) The measurement is between 4.002 and 4.004 g.

D) The measurement is between 4.0031 and 4.0033 g.

E) The measurement is between 3.99 and 4.01 g.

Answer: D

Diff: 3

Section: 1.8

LO: 1.8

Global LO: G4

77) In which of the following numbers are **all** of the zeros not significant?

A) 3300

B) 0.0450

C) 45.060

D) 607.80

E) 5408

Answer: A

Diff: 1

Section: 1.8

LO: 1.8

Global LO: G4

78) What is the total length of two pieces of tubing which measure 4.5 cm and 3.222 cm? Express the answer to the correct number of significant figures.

A) 3.722 cm

B) 4.722 cm

C) 7.722 cm

D) 7.7 cm

E) 8 cm

Answer: D

Diff: 2

Section: 1.9

LO: 1.9

Global LO: G4

79) Find the difference between two masses measured as 123.6 grams and 115.972 grams. Express the answer to the correct number of significant figures.

A) 7.6 grams

B) 7.63 grams

C) 7.628 grams

D) 8.0 grams

E) 8 grams

Answer: A

Diff: 2

Section: 1.9

LO: 1.9

Global LO: G4

80) What is the area of a piece of metal foil that measures 43.9 cm by 29.21 cm? Express the answer to the correct number of significant figures.

A) 128 

B) 1280 

C) 1282.3 

D) 1282.32 

E) 1282.319 

Answer: B

Diff: 2

Section: 1.9

LO: 1.9

Global LO: G4

81) The numerical value for (5.6 × 104) ÷ (7.89 × 102) is equal to, with the proper number of significant figures:

A) 70.976

B) 71

C) 7.098 × 101

D) 71.0

E) 70.98

Answer: B

Diff: 2

Section: 1.9

LO: 1.8, 1.9

Global LO: G4

82) What is the numerical value of ? Express your answer using the correct number of significant figures.

A) 

B) 1 × 

C) 1.2 × 

D) 1.23 × 

E) 1.227 × 

Answer: D

Diff: 2

Section: 1.9

LO: 1.8, 1.9

Global LO: G4

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

 

A) 1

B) 2

C) 3

D) 4

E) 5

Answer: B

Diff: 2

Section: 1.9

LO: 1.8, 1.9

Global LO: G4

84) What is the total length of two pieces of rubber tubing which are 7.69 cm and 4.028 cm in length? Express this answer to the correct number of significant figures.

A) 11.7 cm

B) 11.69 cm

C) 11.718 cm

D) 11.72 cm

E) 12 cm

Answer: D

Diff: 2

Section: 1.9

LO: 1.5

Global LO: G4

85) What is the numerical value of (2.1 × )(4.0 × ) expressed to the correct number of significant figures?

A) 8.4

B) 8.4 × 

C) 8.4 × 

D) 8.4 × 

E) None of the above.

Answer: B

Diff: 2

Section: 1.9

LO: 1.8, 1.9

Global LO: G4

86) What is the numerical value of ?

A) 1.2

B) 1.2 × 

C) 1.2 × 

D) 1.2 × 

E) 1.2 × 

Answer: D

Diff: 3

Section: 1.9

LO: 1.8, 1.9

Global LO: G4

87) How many centimeters are contained in 12.5 inches?

A) 4.92 cm

B) 5.10 cm

C) 31.8 cm

D) 492 cm

E) None of the above.

Answer: C

Diff: 1

Section: 1.10

LO: 1.10

Global LO: G4

88) How many grams are contained in 1.20 pounds?

A) 545 g

B) 378 g

C) 264 g

D) 2.2 g

E) 1.20 g

Answer: A

Diff: 1

Section: 1.10

LO: 1.10

Global LO: G4

89) How many inches are contained in 25.4 cm?

A) 100 inches

B) 64.5 inches

C) 25.4 inches

D) 10.0 inches

E) 0.10 inches

Answer: D

Diff: 1

Section: 1.10

LO: 1.10

Global LO: G4

90) How many centimeters are there in one kilometer?

A)  cm

B)  cm

C)  cm

D)  cm

E)  cm

Answer: A

Diff: 1

Section: 1.10

LO: 1.10

Global LO: G4

91) An analysis showed a sample to contain 0.00471 grams of lead. How many micrograms is this?

A) 0.471 μg

B) 4.71 ×  μg

C) 4.71 ×  μg

D) 4.71 ×  μg

E) 4.71 ×  μg

Answer: B

Diff: 1

Section: 1.10

LO: 1.10

Global LO: G4

92) The conversion factor used to convert 15.0 inches to cm is

A) .

B) .

C) .

D) .

E) .

Answer: A

Diff: 2

Section: 1.10

LO: 1.10

Global LO: G4

93) The conversion factor used to convert 55.6 km to miles is

A) .

B) .

C) .

D) .

E) .

Answer: C

Diff: 2

Section: 1.10

LO: 1.10

Global LO: G4

94) An extra-strength aspirin contains 0.500 g of aspirin. How many grains is this? 

A) 7.72 grains

B) 13.0 grains

C) 32.4 grains

D) 65.3 grains

E) 3.24 × 104 grains

Answer: A

Diff: 2

Section: 1.10

LO: 1.10

Global LO: G4

95) How many quarts are contained in 450. mL?

A) 0.426 quart

B) 2.10 quarts

C) 426 quarts

D) 475 quarts

E) 0.475 quarts

Answer: E

Diff: 2

Section: 1.10

LO: 1.10

Global LO: G4

96) How many pounds are contained in 84.0 kg?

A) 0.038 lb

B) 0.084 lb

C) 38.0 lb

D) 185 lb

E) 380 lb

Answer: D

Diff: 2

Section: 1.10

LO: 1.10

Global LO: G4

97) A sample of an experimental medication was calculated to contain 0.392 g of active drug. How many milligrams is this?

A) 392 mg

B) 0.0392 mg

C) 3.92 ×  mg

D) 3.92 ×  mg

E) 3.92 ×  mg

Answer: A

Diff: 2

Section: 1.10

LO: 1.10

Global LO: G4

98) How many ng are there in 5.2 mg?

A) 1.9 ×  ng

B) 1.9 ×  ng

C) 5.2 ×  ng

D) 5.2 ×  ng

E) 5.2 ×  ng

Answer: D

Diff: 2

Section: 1.10

LO: 1.10

Global LO: G4

99) The dosage of quinine when a 145-lb adult takes a 200.-mg tablet is \_\_\_\_\_\_\_\_ μg drug per kg of body weight.

A) 1.38 × 106

B) 1.60 × 103

C) 3.04 × 103

D) 4.41 × 105

E) 15.2

Answer: C

Diff: 3

Section: 1.10

LO: 1.10

Global LO: G4

100) An object weighs 37.4 kg. What does the object weigh in the English system?

 1 lb = 453.6 g

A) 82.5 lb

B) 16,965 lb

C) 0.0825 lb

D) 169.65 lb

E) 370.0 lb

Answer: A

Diff: 2

Section: 1.10

LO: 1.10

Global LO: G4

101) If gasoline sells for 95.4 cents per liter, what is its cost on a per gallon basis?

 1 L = 1.06 qt

A) $3.60

B) $4.04

C) $3.82

D) $404.50

E) $36.00

Answer: A

Diff: 2

Section: 1.10

LO: 1.10

Global LO: G4

102) Is 25 kilometers per liter good gas mileage for a VW Rabbit diesel? Hint: How do we measure mileage in the English system?

Answer: It's good: 59 miles/gal.

Diff: 3

Section: 1.10

LO: 1.10

Global LO: G4

103) If an automobile gets 24.5 miles to the gallon and the cost of gasoline is $2.75 a gallon, how much will it cost to drive 975 km?

Answer: $68.00

Diff: 3

Section: 1.10

LO: 1.10

Global LO: G4

104) 68°C is the same as

A) 341 K.

B) 321 K.

C) 285 K.

D) 205 K.

E) 158 K.

Answer: A

Diff: 1

Section: 1.11

LO: 1.11

Global LO: G4

105) What temperature is 325 K on the Celsius scale?

A) 52°C

B) 126°C

C) 344°C

D) 598°C

E) 617°C

Answer: A

Diff: 1

Section: 1.11

LO: 1.11

Global LO: G4

106) 95.0°F is the same as

A) 21.0°C.

B) 35.0°C.

C) 85.0°C.

D) 171°C.

E) 203°C.

Answer: B

Diff: 2

Section: 1.11

LO: 1.11

Global LO: G4

107) What temperature is -10.°C on the Fahrenheit scale?

A) 263°F

B) 26°F

C) 14°F

D) -6.0°F

E) -18°F

Answer: C

Diff: 2

Section: 1.11

LO: 1.11

Global LO: G4

108) What temperature is 75°F on the Kelvin scale?

A) 24 K

B) 43 K

C) 215 K

D) 297 K

E) 348 K

Answer: D

Diff: 2

Section: 1.11

LO: 1.11

Global LO: G4

109) What is the temperature at which the Celsius and Fahrenheit scales read the same?

A) -40

B) 100

C) 25

D) -100

E) Never

Answer: A

Diff: 3

Section: 1.11

LO: 1.11

Global LO: G4

110) Why is the number 32 (and not some other value) used in the formula for converting between Celsius and Fahrenheit temperatures?

Answer: The 32 compensates for the fact that the Celsius scale uses zero as its reference point for the freezing point of water, but the Fahrenheit scale uses 32 as this reference point.

Diff: 2

Section: 1.11

LO: 1.11

Global LO: G4

111) Why is the number 1.8 (and not some other value) used in the formula for converting between Celsius and Fahrenheit temperatures?

Answer: This value compensates for the different size of the two degrees. In the Celsius scale there are 100 degrees between the freezing point and the boiling point of water, but in the Fahrenheit scale there are 180 degrees to cover the same interval. The ratio of 180 to 100 is 1.8, so this correction factor is used in the formula.

Diff: 2

Section: 1.11

LO: 1.11

Global LO: G4

112) Why is the number 273.15 (and not some other value) used in the formula for converting between Celsius and Kelvin temperatures?

Answer: This value compensates for the fact that the freezing point of water on the Celsius scale is 273.15 degrees lower than on the Kelvin scale. Since kelvins are the same size as Celsius degrees, no other correction factors are needed.

Diff: 2

Section: 1.11

LO: 1.11

Global LO: G4

113) How many calories are released when 500 g of water cools from 95.0°C to 25.0°C?

A) 35.0 cal

B) 70.0 cal

C) 1.25 ×  cal

D) 3.50 ×  cal

E) 4.75 ×  cal

Answer: D

Diff: 1

Section: 1.11

LO: 1.12

Global LO: G4

114) If 55.0 g of olive oil has 877 cal of heat added to it at a room temperature of 26.0°C, what will be the *final temperature* of the olive oil? The specific heat of olive oil is 2.19 cal/g°C.

A) 33.3°C

B) 7.3°C

C) 19.0°C

D) 26.0°C

E) 3.3 °C

Answer: A

Diff: 3

Section: 1.11

LO: 1.12

Global LO: G4

115) If 75.0 g of water at 30.0°C absorbs 900 calories, the new temperature will be

A) 18.0°C.

B) 22.0°C.

C) 42.0°C.

D) 105°C.

E) 160°C.

Answer: C

Diff: 3

Section: 1.11

LO: 1.12

Global LO: G4

116) What is the specific heat of a metal if it takes 26.5 calories to raise the temperature of a piece weighing 50.0 g by 5.00 degrees Celsius?

A) 250 cal/g °C

B) 133 cal/g °C

C) 6.63 cal/g °C

D) 1.89 cal/g °C

E) 0.106 cal/g °C

Answer: E

Diff: 3

Section: 1.11

LO: 1.12

Global LO: G4

117) What is the specific heat of a metal if it takes 48.4 calories to raise the temperature of a 45.0 g sample by 5.0°C?

A) 0.186 cal/g °C

B) 0.215 cal/g °C

C) 5.34 cal/g °C

D) 225 cal/g °C

E) 242 cal/g °C

Answer: B

Diff: 3

Section: 1.11

LO: 1.12

Global LO: G4

118) What is the density of a 6.0 × 102 mL liquid sample that weighs 450 g?

A) 1050 g/mL

B) 270 g/mL

C) 1.33 g/mL

D) 0.75 g/mL

E) 0.37 g/mL

Answer: D

Diff: 1

Section: 1.12

LO: 1.13

Global LO: G4

119) Calculate the density of cyclohexane if a 50.0 g sample has a volume of 64.3 mL.

A) 114.3 g/mL

B) 14.3 g/mL

C) 1.29 g/mL

D) 0.778 g/mL

E) 0.322 g/mL

Answer: D

Diff: 1

Section: 1.12

LO: 1.13

Global LO: G4

120) A 35.0 mL sample of a liquid weighs 27.2 g. What is the density of the liquid?

A) 62.2 g/mL

B) 7.80 g/mL

C) 1.29 g/mL

D) 0.952 g/mL

E) 0.777 g/mL

Answer: E

Diff: 1

Section: 1.12

LO: 1.13

Global LO: G4

121) What is the specific gravity of a liquid sample with a mass of 35.0 g and a volume of 14.00 mL?

A) 14.0 g/mL

B) 2.50 g/mL

C) 21.0

D) 14.0

E) 2.50

Answer: E

Diff: 1

Section: 1.12

LO: 1.13

Global LO: G4

122) What is the volume of a gold nugget that weighs 2.20 kg? The density of gold is 

A) 8.60 ×  

B) 116 

C) 11.6 

D) 8.60 

E) 0.116 

Answer: B

Diff: 2

Section: 1.12

LO: 1.13

Global LO: G4

123) What is the mass of 30.0 mL of a solution with a density of 1.60 g/mL?

A) 53.3 g

B) 48.0 g

C) 31.6 g

D) 18.8 g

E) none of the above

Answer: B

Diff: 2

Section: 1.12

LO: 1.13

Global LO: G4

124) A 2.36  sample of an unknown metal weighs 18.5 g. What is the sample's density?

A) 7.84 g/

B) 0.127 /g

C) 15.75 g/

D) 0.784 g/

E) 1.27 /g

Answer: A

Diff: 2

Section: 1.12

LO: 1.13

Global LO: G4

125) Gasoline has a density of about 0.65 g/mL. How much does 34.0 L weigh in pounds?

Answer: Convert 34.0 L to mL then multiply by the density to obtain the grams.

Convert grams to pounds: 34,000 mL × 0.65 g/mL × 1 lb/454 g = 48.7 lbs.

Diff: 2

Section: 1.12

LO: 1.13

Global LO: G4

126) A gas at 25°C exactly fills a container previously determined to have a volume of 1.05 × 103 cm3. The container plus gas are weighed and found to have a mass of 837.6 g. The container, when emptied of all gas, has a mass of 836.2 g. What is the density of the gas at 25°C?

Answer: 1.3 × 10-3 g/cm3

Diff: 2

Section: 1.12

LO: 1.13

Global LO: G4

127) Which of the following statements is true of specific gravity?

A) It has the units of g/cm3.

B) Specific gravity is constant at any temperature.

C) Specific gravity is unitless because it is the density of one substance divided by the density of water.

D) Specific gravity is a measure of the reactivity index of a substance.

Answer: C

Diff: 2

Section: 1.12

LO: 1.13

Global LO: G4

128) Explain how density can be used to determine the volume of carbon tetrachloride (which is a liquid at room temperature) needed to make a mixture using 37.2 of carbon tetrachloride.

Answer: Notice that the student is not asked to solve the problem, but to explain the reasoning. Density can be used as a conversion factor because the definition essentially states that x g of substance is equivalent to y mL of the substance. Therefore, the two conversion factors,  and , can be written and the appropriate one used to make the desired conversion.

Diff: 3

Section: 1.12

LO: 1.13

Global LO: G4