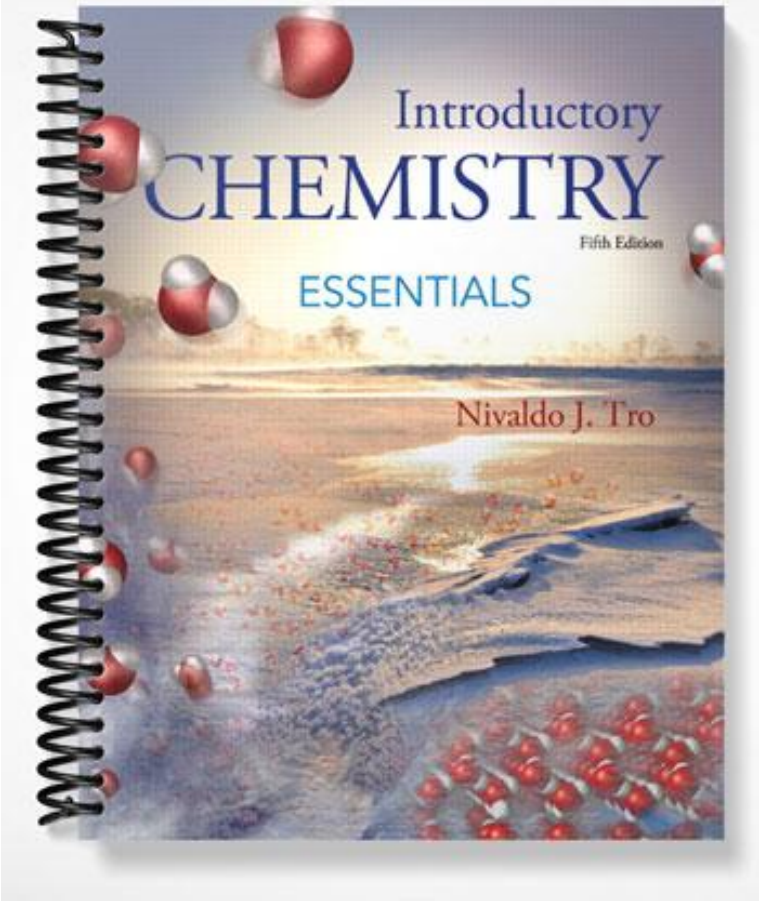
TEST BANK


Introductory
CHEMISTRY
Fifth Edition
ESSENTIALS
Nivaldo J. Tro

Introductory Chemistry, 5e **(Tro)**
Chapter 2 Measurement and Problem Solving

True/False Questions

1) Numbers are usually written so that the uncertainty is in the last reported digit.
Answer: TRUE
Diff: 1 Page Ref: 2.1
Learning Outcome: 2.2
Global Outcome: G1

2) The decimal number 0.0000010 expressed in scientific notation is 1.0×10^{6}.
Answer: FALSE
Diff: 1 Page Ref: 2.2
Learning Outcome: 2.1
Global Outcome: G4

3) The decimal number 0.0210 expressed in scientific notation is 2.10×10^{-2}.
Answer: TRUE
Diff: 1 Page Ref: 2.2
Learning Outcome: 2.2
Global Outcome: G4

4) The mass of an object, 4.55×10^{-3} g, expressed in decimal notation is 0.000455 g.
Answer: FALSE
Diff: 1 Page Ref: 2.2
Learning Outcome: 2.2
Global Outcome: G4

5) If you count 7 pennies, you can only report one significant figure in that measurement.
Answer: FALSE
Diff: 1 Page Ref: 2.3
Learning Outcome: 2.3
Global Outcome: G4

6) Exact numbers have an unlimited number of significant figures.
Answer: TRUE
Diff: 1 Page Ref: 2.3
Learning Outcome: 2.3
Global Outcome: G1

7) Zeros located between two numbers are not significant.
Answer: FALSE
Diff: 1 Page Ref: 2.3
Learning Outcome: 2.3
Global Outcome: G1

Copyright © 2015 Pearson Education, Inc.

8) Zeros located after a number and after a decimal point are significant.
Answer: TRUE
Diff: 1 Page Ref: 2.3
Learning Outcome: 2.3
Global Outcome: G1

9) Trailing zeros at the end of a number, but before an implied decimal point, are ambiguous.
Answer: TRUE
Diff: 1 Page Ref: 2.3
Learning Outcome: 2.3
Global Outcome: G1

10) Trailing zeros before a decimal point but after a non-zero number are considered significant figures.
Answer: TRUE
Diff: 1 Page Ref: 2.3
Learning Outcome: 2.3
Global Outcome: G1

11) The number 0.010100 has five significant figures.
Answer: TRUE
Diff: 1 Page Ref: 2.3
Learning Outcome: 2.3
Global Outcome: G4

12) The number 4,450,000.0 has 3 significant figures.
Answer: FALSE
Diff: 1 Page Ref: 2.3
Learning Outcome: 2.3
Global Outcome: G4

13) The number 7.20×10^3 contains three significant figures.
Answer: TRUE
Diff: 1 Page Ref: 2.3
Learning Outcome: 2.3
Global Outcome: G4

14) When the temperature of an object is reported as 23.7°C, the actual temperature can be assumed to be between 23.6°C and 23.8°C.
Answer: TRUE
Diff: 1 Page Ref: 2.3
Learning Outcome: 2.2
Global Outcome: G4

Copyright © 2015 Pearson Education, Inc.

15) Scientific numbers are reported so that every digit is certain except the last, which is estimated.
Answer: TRUE
Diff: 1 Page Ref: 2.3
Learning Outcome: 2.2
Global Outcome: G1

16) When the number 65.59 is rounded to contain 2 significant figures, it becomes 66.0.
Answer: FALSE
Diff: 1 Page Ref: 2.4
Learning Outcome: 2.3
Global Outcome: G4

17) When the number 2.35 is rounded to contain 2 significant figures it becomes 2.4.
Answer: TRUE
Diff: 1 Page Ref: 2.4
Learning Outcome: 2.3
Global Outcome: G4

18) In multiplication and division calculations, the answer will have the same number of decimal places as the number carrying the fewest decimal places.
Answer: FALSE
Diff: 1 Page Ref: 2.4
Learning Outcome: 2.4
Global Outcome: G1

19) In multiplication or division calculations, the answer will have the same number of decimal places as the number carrying the most decimal places.
Answer: FALSE
Diff: 1 Page Ref: 2.4
Learning Outcome: 2.4
Global Outcome: G1

20) In addition or subtraction, the result carries the same number of decimal places as the quantity carrying the fewest decimal places.
Answer: TRUE
Diff: 1 Page Ref: 2.4
Learning Outcome: 2.5
Global Outcome: G1

21) The mass of an object depends on gravity.
Answer: FALSE
Diff: 1 Page Ref: 2.5
Learning Outcome: 2.7
Global Outcome: G1

Copyright © 2015 Pearson Education, Inc.

22) The base unit of length in the SI system is the cm.
Answer: FALSE
Diff: 1 Page Ref: 2.5
Learning Outcome: 2.7
Global Outcome: G1

23) The base unit of mass in the SI system is the kg.
Answer: TRUE
Diff: 1 Page Ref: 2.5
Learning Outcome: 2.7
Global Outcome: G1

24) The prefix nano represents the multiplier 0.000000001.
Answer: TRUE
Diff: 1 Page Ref: 2.5
Learning Outcome: 2.7
Global Outcome: G4

25) The prefix micro represents the multiplier 0.001.
Answer: FALSE
Diff: 1 Page Ref: 2.5
Learning Outcome: 2.7
Global Outcome: G4

26) A nine gigagram mass is heavier than a nine nanogram mass.
Answer: TRUE
Diff: 1 Page Ref: 2.5
Learning Outcome: 2.7
Global Outcome: G4

27) The prefix in the name of a polygon indicates how many sides this geometric figure has, so a "decagon" would have ten sides.
Answer: TRUE
Diff: 1 Page Ref: 2.5
Learning Outcome: 2.7
Global Outcome: G2

28) There are 1000 kilometers in one meter.
Answer: FALSE
Diff: 1 Page Ref: 2.5
Learning Outcome: 2.8
Global Outcome: G4

Copyright © 2015 Pearson Education, Inc.

29) You do not need to write units in calculations as long as you can remember them.
Answer: FALSE
Diff: 1 Page Ref: 2.6
Learning Outcome: 2.8
Global Outcome: G1

30) Conversion factors are constructed from any two quantities known to be equivalent.
Answer: TRUE
Diff: 1 Page Ref: 2.6
Learning Outcome: 2.8
Global Outcome: G1

31) A conversion factor is a fraction with one unit on top and a different unit on the bottom.
Answer: TRUE
Diff: 1 Page Ref: 2.6
Learning Outcome: 2.8
Global Outcome: G1

32) A solution map diagrams the steps required to get from the starting point to the end point of a calculation problem.
Answer: TRUE
Diff: 1 Page Ref: 2.6
Learning Outcome: 2.8
Global Outcome: G1

33) A *solution map* is the section near the back of the textbook that provides the answers to assigned problems.
Answer: FALSE
Diff: 1 Page Ref: 2.6
Learning Outcome: 2.8
Global Outcome: G1

34) One mile measures 5,280 feet long, so one square mile is equivalent to 5,280 square feet.
Answer: FALSE
Diff: 1 Page Ref: 2.8
Learning Outcome: 2.8
Global Outcome: G4

35) Given that 1 inch equals 2.54 centimeters, then 1 cubic inch equals 16.387 cubic centimeters.
Answer: TRUE
Diff: 1 Page Ref: 2.8
Learning Outcome: 2.8
Global Outcome: G4

Copyright © 2015 Pearson Education, Inc.

36) All solids have the same density.
Answer: FALSE
Diff: 1 Page Ref: 2.9
Global Outcome: G7

37) Suppose a symmetrical metal rod of the element lead has a density of 11.4 g/cm^3. If this rod is cut in half, the density of each piece is now 5.7 g/cm^3.
Answer: FALSE
Diff: 1 Page Ref: 2.9
Learning Outcome: 2.10a
Global Outcome: G9

38) If you are given the mass and density of an object, you can calculate the volume by using the equation: V = m/d.
Answer: TRUE
Diff: 1 Page Ref: 2.9
Learning Outcome: 2.10a
Global Outcome: G1

39) If you know the density of a liquid and its volume, the mass of the liquid may be calculated using the equation: m = V/d.
Answer: FALSE
Diff: 1 Page Ref: 2.9
Learning Outcome: 2.10a
Global Outcome: G1

40) The density of iron is 7.86 g/cm^3 while the density of lead is 11.4 g/cm^3. If you had one cm^3 of each metal, the piece of iron would have a greater mass.
Answer: FALSE
Diff: 1 Page Ref: 2.9
Learning Outcome: 2.10a
Global Outcome: G2

Copyright © 2015 Pearson Education, Inc.

Multiple Choice Questions

1) The correct scientific notation for the number 0.00050210 is:
A) 5.0210×10^{4}
B) 5.021×10^{-4}
C) 5.021×10^{4}
D) 5.0210×10^{-4}
E) none of the above
Answer: D
Diff: 1 Page Ref: 2.2
Learning Outcome: 2.1
Global Outcome: G4

2) The correct scientific notation for the number 500.0 is:
A) 5×10^{2}
B) 5.00×10^{2}
C) 5.000×10^{2}
D) 5×10^{-2}
E) none of the above
Answer: C
Diff: 1 Page Ref: 2.2
Learning Outcome: 2.1
Global Outcome: G4

3) The distance between the two hydrogen atoms in a molecule of water is 0.000000000172 m. Express this distance in scientific notation.
A) 1.72×10^{-9} m
B) 1.72×10^{-10} m
C) 0.172×10^{-10} m
D) 17.2×10^{9} m
E) 1.72×10^{10} m
Answer: B
Diff: 1 Page Ref: 2.2
Learning Outcome: 2.1
Global Outcome: G4

Copyright © 2015 Pearson Education, Inc.

4) The wavelength of blue light is 0.00000045 m. Express this wavelength in scientific notation.
A) 4.5×10^{-6} m
B) 4.5×10^{6} m
C) 4.5×10^{-7} m
D) 4.5×10^{7} m
E) 0.45×10^{-7} m
Answer: C
Diff: 1 Page Ref: 2.2
Learning Outcome: 2.1
Global Outcome: G4

5) The correct decimal representation of 1.201×10^{-7} is:
A) 12010000
B) 0.0001201
C) 0.0000001201
D) 1201.000
E) none of the above
Answer: C
Diff: 1 Page Ref: 2.2
Learning Outcome: 2.1
Global Outcome: G4

6) The correct decimal representation of 6.453×10^{3} is:
A) 6,453
B) 0.006453
C) 6.5×10^{3}
D) 6.453
E) none of the above
Answer: A
Diff: 1 Page Ref: 2.2
Learning Outcome: 2.1
Global Outcome: G4

7) Suppose a thermometer has marks at every one degree increment and the mercury level on the thermometer is exactly between the 25 and 26 degree Celsius marks. We should properly report the temperature measurement as:
A) 25°C
B) 26°C
C) 25.5°C
D) 25.50°C
E) 25.55°C
Answer: C
Diff: 1 Page Ref: 2.3
Learning Outcome: 2.2
Global Outcome: G3

Copyright © 2015 Pearson Education, Inc.

8) In the number 48.93, which digit is estimated?
A) 4
B) 8
C) 9
D) 3
E) None of the above, all digits are certain.
Answer: D
Diff: 1 Page Ref: 2.3
Learning Outcome: 2.2
Global Outcome: G1

9) There are exactly 2.54 centimeters in 1 inch. When using this conversion factor, how many significant figures are you limited to?
A) 1
B) 3
C) ambiguous
D) depends on if you are using it in multiplication/division or addition/subtraction
E) infinite number of significant figures
Answer: E
Diff: 1 Page Ref: 2.3
Learning Outcome: 2.3
Global Outcome: G4

10) The correct number of significant figures in the number 865,000 is:
A) 3
B) 6
C) 4
D) ambiguous
E) none of the above
Answer: D
Diff: 1 Page Ref: 2.3
Learning Outcome: 2.3
Global Outcome: G4

11) The correct number of significant figures in the number 1.250100 is:
A) 5
B) 7
C) 4
D) ambiguous
E) none of the above
Answer: B
Diff: 1 Page Ref: 2.3
Learning Outcome: 2.3
Global Outcome: G4

Copyright © 2015 Pearson Education, Inc.

12) The correct number of significant figures in the number 0.027090 is:
A) 7
B) 6
C) 5
D) ambiguous
E) none of the above
Answer: C
Diff: 1 Page Ref: 2.3
Learning Outcome: 2.3
Global Outcome: G4

13) The correct number of significant figures in the number "9.080×10^{4}" is:
A) 3
B) 4
C) 5
D) ambiguous
E) none of the above
Answer: B
Diff: 1 Page Ref: 2.3
Learning Outcome: 2.3
Global Outcome: G4

14) The correct number of significant figures in the number 4.0×10^{-2} is:
A) 1
B) 2
C) 3
D) ambiguous.
E) none of the above
Answer: B
Diff: 1 Page Ref: 2.3
Learning Outcome: 2.3
Global Outcome: G4

15) The correct number of significant figures in the number 0.002320 is:
A) 7
B) 4
C) 3
D) ambiguous
E) none of the above
Answer: B
Diff: 1 Page Ref: 2.3
Learning Outcome: 2.3
Global Outcome: G4

Copyright © 2015 Pearson Education, Inc.

16) Which of the following statements is NOT part of the rules for determining significant figures?
A) Non-zero digits at the end of a number are not significant.
B) Zeroes between two numbers are significant.
C) Zeroes to the left of the first non-zero number are not significant.
D) Trailing zeroes at the end of a number, but before an implied decimal point are ambiguous.
E) All of the above statements are part of the rules.
Answer: A
Diff: 1 Page Ref: 2.3
Learning Outcome: 2.3
Global Outcome: G1

17) When the value 4.449 is rounded to two significant figures, the number should be reported as:
A) 4.4
B) 4.5
C) 4.44
D) 4.45
E) none of the above
Answer: A
Diff: 1 Page Ref: 2.4
Learning Outcome: 2.3
Global Outcome: G4

18) How many significant digits should be reported in the answer to the following calculation?
$(4.3 - 3.7) \times 12.3 =$
A) 1
B) 2
C) 3
D) 4
E) none of the above
Answer: A
Diff: 2 Page Ref: 2.4
Learning Outcome: 2.6
Global Outcome: G4

19) Determine the answer for the equation below with correct number of significant figures:
$3.215 \times 13.2 \div 0.218 =$ _____
A) 194.669
B) 195
C) 194.7
D) 194.67
E) none of the above
Answer: B
Diff: 2 Page Ref: 2.4
Learning Outcome: 2.6
Global Outcome: G4

Copyright © 2015 Pearson Education, Inc.

20) Determine the answer for the equation below with correct number of significant figures:
$1.2 \times 1.79 =$ _____
A) 2.148
B) 2.15
C) 2.1
D) 2.2
E) none of the above
Answer: C
Diff: 2 Page Ref: 2.4
Learning Outcome: 2.4
Global Outcome: G4

21) Determine the answer to the following equation with correct number of significant figures:
$106 \div 9.02 \times 1.9 =$ _____
A) 22.32816
B) 22.328
C) 22.3
D) 22
E) none of the above
Answer: D
Diff: 2 Page Ref: 2.4
Learning Outcome: 2.4
Global Outcome: G4

22) Determine the answer to the following equation with correct number of significant figures:
$2.02 + 8.102 - 0.0297 =$ _____
A) 10.0923
B) 10.09
C) 10.1
D) 10.092
E) none of the above
Answer: B
Diff: 2 Page Ref: 2.4
Learning Outcome: 2.5
Global Outcome: G4

Copyright © 2015 Pearson Education, Inc.

23) Determine the answer to the following equation with correct number of significant figures:
13.96 - 4.9102 + 71.5 = _____
A) 80.5498
B) 81
C) 80.5
D) 80.55
E) none of the above
Answer: C
Diff: 2 Page Ref: 2.4
Learning Outcome: 2.5
Global Outcome: G4

24) Determine the answer to the following equation with correct number of significant figures:
(4.123 × 0.12) + 24.2 = _____
A) 25
B) 24.695
C) 24.70
D) 24.7
E) none of the above
Answer: D
Diff: 2 Page Ref: 2.4
Learning Outcome: 2.6
Global Outcome: G4

25) Determine the answer to the following equation with correct number of significant figures:
(17.103 + 2.03) × 1.02521 = _____
A) 19.6153
B) 19.62
C) 19.6
D) 20
E) none of the above
Answer: B
Diff: 2 Page Ref: 2.4
Learning Outcome: 2.6
Global Outcome: G4

26) The correct prefix for the multiplier 1,000,000 is:
A) mega.
B) milli.
C) micro.
D) nano.
E) none of the above
Answer: A
Diff: 1 Page Ref: 2.5
Learning Outcome: 2.7
Global Outcome: G4

Copyright © 2015 Pearson Education, Inc.

27) The correct prefix for the multiplier 1,000 is:
A) mega.
B) milli.
C) micro.
D) nano.
E) none of the above
Answer: E
Diff: 1 Page Ref: 2.5
Learning Outcome: 2.7
Global Outcome: G4

28) The correct prefix for the multiplier 0.1 is:
A) tera.
B) deci.
C) femto.
D) pico.
E) none of the above
Answer: B
Diff: 1 Page Ref: 2.5
Learning Outcome: 2.7
Global Outcome: G4

29) The correct prefix for the multiplier 0.000001 is:
A) mega.
B) milli.
C) micro.
D) nano.
E) none of the above
Answer: C
Diff: 1 Page Ref: 2.5
Learning Outcome: 2.7
Global Outcome: G4

30) The correct prefix for the multiplier 100 is:
A) mega.
B) hecto.
C) centi.
D) nano.
E) none of the above
Answer: B
Diff: 1 Page Ref: 2.5
Learning Outcome: 2.7
Global Outcome: G1

Copyright © 2015 Pearson Education, Inc.

31) The correct prefix for the multiplier 10 is:
A) deca.
B) deci.
C) tera.
D) centi.
E) none of the above
Answer: A
Diff: 1 Page Ref: 2.5
Learning Outcome: 2.7
Global Outcome: G1

32) The correct prefix for the multiplier 1,000,000,000 is:
A) mega.
B) milli.
C) tera.
D) giga.
E) none of the above
Answer: D
Diff: 1 Page Ref: 2.5
Learning Outcome: 2.7
Global Outcome: G4

33) The correct multiplier for the prefix pico is:
A) 10^{-3}
B) 10^{-6}
C) 10^{-9}
D) 10^{-12}
E) none of the above
Answer: D
Diff: 1 Page Ref: 2.5
Learning Outcome: 2.7
Global Outcome: G4

34) The correct multiplier for the prefix femto is:
A) 10^{-15}
B) 10^{-12}
C) 10^{12}
D) 10^{9}
E) none of the above
Answer: A
Diff: 1 Page Ref: 2.5
Learning Outcome: 2.7
Global Outcome: G4

Copyright © 2015 Pearson Education, Inc.

35) The correct multiplier for the prefix milli is:
A) 10^{-3}
B) 10^{-6}
C) 10^{-9}
D) 10^{-12}
E) none of the above
Answer: A
Diff: 1 Page Ref: 2.5
Learning Outcome: 2.7
Global Outcome: G4

36) The correct multiplier for the prefix micro is:
A) 10^{3}
B) 10^{-6}
C) 10^{-9}
D) 10^{6}
E) none of the above
Answer: B
Diff: 1 Page Ref: 2.5
Learning Outcome: 2.7
Global Outcome: G4

37) What is the base SI unit for length?
A) mile
B) centimeter
C) foot
D) meter
E) none of the above
Answer: D
Diff: 1 Page Ref: 2.5
Learning Outcome: 2.7
Global Outcome: G1

38) What is the base SI unit for mass?
A) kilogram
B) gram
C) pound
D) ton
E) none of the above
Answer: A
Diff: 1 Page Ref: 2.5
Learning Outcome: 2.7
Global Outcome: G1

Copyright © 2015 Pearson Education, Inc.

39) The base SI unit for temperature is:
A) Fahrenheit.
B) Kelvin.
C) Celsius.
D) atmospheres.
E) none of the above
Answer: B
Diff: 1 Page Ref: 2.5
Learning Outcome: 2.7
Global Outcome: G1

40) Which measurement below represents the heaviest mass?
A) 1 mg
B) 1 kg
C) 1 pg
D) 1 Mg
E) 1 dg
Answer: D
Diff: 1 Page Ref: 2.5
Learning Outcome: 2.7
Global Outcome: G2

41) Which of the following sets of units is NOT in the order of increasing size?
A) μg < g < kg
B) mL < dL < L
C) ns < ms < s
D) cm < μm < km
E) μmol < mmol < mol
Answer: D
Diff: 2 Page Ref: 2.5
Learning Outcome: 2.7
Global Outcome: G2

42) An American nickel five cent coin has a mass of approximately 5 grams. Five grams is equivalent to which term?
A) 5000 kilograms
B) 5000 milligrams
C) 50 centigrams
D) 5000 micrograms
E) none of the above
Answer: B
Diff: 2 Page Ref: 2.5
Learning Outcome: 2.8
Global Outcome: G2|G4

Copyright © 2015 Pearson Education, Inc.

43) Which of the following would NOT be considered a correct conversion factor?
A) 1 dozen eggs = 12 eggs
B) 12 eggs = 1 dozen eggs
C) 1 pair of shoes = 1 shoe
D) 100 pennies = 1 dollar
E) 5 cents = 1 nickel
Answer: C
Diff: 1 Page Ref: 2.5
Learning Outcome: 2.8
Global Outcome: G2

44) The common English unit in which the speed of an automobile is expressed is miles/hr. What is the set of base SI units for speed?
A) mile/s
B) km/hr
C) km/s
D) m/s
E) none of the above
Answer: D
Diff: 3 Page Ref: 2.5
Learning Outcome: 2.7
Global Outcome: G1

45) The typical problem-solving procedure involves four steps in the order:
A) sort, strategize, solve, check.
B) strategize, solve, sort, check.
C) check, strategize, sort, solve.
D) solve, sort, check, strategize.
Answer: A
Diff: 1 Page Ref: 2.6
Learning Outcome: 2.8
Global Outcome: G9

46) How many inches are in 25.8 cm?
A) 0.10
B) 28.3
C) 0.0984
D) 10.2
E) none of the above
Answer: D
Diff: 2 Page Ref: 2.6
Learning Outcome: 2.8
Global Outcome: G4

Copyright © 2015 Pearson Education, Inc.

47) How many inches are in 2.80 ft?
A) 34
B) 33.6
C) 0.233
D) 4.29
E) none of the above
Answer: B
Diff: 2 Page Ref: 2.6
Learning Outcome: 2.8
Global Outcome: G4

48) How many grams are in 1.48×10^{7} μg?
A) 1.48×10^{3}
B) 1.48×10^{13}
C) 1.48
D) 14.8
E) none of the above
Answer: D
Diff: 2 Page Ref: 2.6
Learning Outcome: 2.8
Global Outcome: G4

49) How many milliliters are in 17.5 L?
A) 175
B) 1.75×10^{-2}
C) 1.75×10^{3}
D) 1.75×10^{4}
E) none of the above
Answer: D
Diff: 2 Page Ref: 2.6
Learning Outcome: 2.8
Global Outcome: G4

50) How many microliters are in 41.0 mL?
A) 4.1×10^{3}
B) 4.1×10^{10}
C) 0.041
D) 4.10×10^{4}
E) none of the above
Answer: D
Diff: 2 Page Ref: 2.6
Learning Outcome: 2.8
Global Outcome: G4

Copyright © 2015 Pearson Education, Inc.

51) How many liters are in 333 mL?
A) 3.33×10^5
B) 0.333
C) 33.3
D) 3.33
E) none of the above
Answer: B
Diff: 2 Page Ref: 2.6
Learning Outcome: 2.8
Global Outcome: G4

52) How many low dose 81 mg aspirin tablets can be made from 1.21 kg of aspirin?
A) 1.5×10^3 tablets
B) 1.5×10^4 tablets
C) 1.5×10^5 tablets
D) 1.21×10^3 tablets
E) 1.21×10^4 tablets
Answer: B
Diff: 2 Page Ref: 2.7
Learning Outcome: 2.8
Global Outcome: G4

53) A 12-oz can of soda pop costs eighty-nine cents. A 2.00 L bottle of the same variety of soda pop costs $2.29. How many times more expensive it is to buy the 12-oz can of pop compared to buying it in a 2.00 L bottle? (1.00 L = 1.057 quart and 1 quart contains 32 oz)
A) 1.9
B) 2.2
C) 2.6
D) 2.8
E) 4.2
Answer: B
Diff: 3 Page Ref: 2.7
Learning Outcome: 2.8
Global Outcome: G4

54) How many cm^3 are there in 2.5 m^3?
A) 2.5×10^6
B) 2.5×10^{-2}
C) 2.5×10^2
D) 2.5×10^{-6}
E) none of the above
Answer: A
Diff: 2 Page Ref: 2.8
Learning Outcome: 2.9
Global Outcome: G4

Copyright © 2015 Pearson Education, Inc.

55) How many cm^3 are there in 1.25 ft^3?
A) 38.1
B) 5.49×10^3
C) 246
D) 3.54×10^4
E) none of the above
Answer: D
Diff: 2 Page Ref: 2.8
Learning Outcome: 2.9
Global Outcome: G4

56) A room has dimensions of 10.0 ft × 20.0 ft × 8.00 ft. Given that there are three feet in a yard, what is the volume of the room in yd^3?
A) 178
B) 59.3
C) 1.60×10^3
D) 533
E) none of the above
Answer: B
Diff: 3 Page Ref: 2.8
Learning Outcome: 2.9
Global Outcome: G4

57) What is the volume of a cube with dimensions 11.0 cm × 11.0 cm × 11.0 cm in m^3?
A) 1.331×10^{-3}
B) 1.33×10^3
C) 1.33×10^{-3}
D) 1.3×10^3
E) none of the above
Answer: C
Diff: 2 Page Ref: 2.8
Learning Outcome: 2.9
Global Outcome: G4

58) Which term below is equivalent to one milliliter?
A) 1 cc
B) 1 mL
C) 1 cm^3
D) all of the above
E) none of the above
Answer: D
Diff: 1 Page Ref: 2.8
Learning Outcome: 2.8
Global Outcome: G4

Copyright © 2015 Pearson Education, Inc.

59) A plastic block has dimensions of 2.2 cm × 3.0 cm × 1.5 cm and a mass of 12.4 grams. Will the block float in water and why?
A) Yes, because the density of the block is 1.3 g/mL which is less than the density of water.
B) Yes, because the density of the block is 0.80 g/mL which is less than the density of water.
C) No, because the density of the block is 1.3 g/mL which is greater than the density of water.
D) No, because the density of the block is 0.80 g/mL which is greater than the density of water.
E) none of the above
Answer: C
Diff: 3 Page Ref: 2.9
Learning Outcome: 2.10a
Global Outcome: G9

60) Suppose a boat engine leaks 938 milliliters of oil into a lake. The mass of this spilled oil is 823 grams. The oil will not mix with the lake water. Which statement is true?
A) The oil will sink because its density of 0.877 g/mL is greater than the density of water.
B) The oil will float because its density of 0.877 g/mL is less than the density of water.
C) The oil will sink because its density of 1.14 g/mL is greater than the density of water.
D) The oil will float because its density of 1.14 g/mL is less than the density of water.
E) none of the above
Answer: B
Diff: 3 Page Ref: 2.9
Learning Outcome: 2.10a
Global Outcome: G7

61) A lead ball has a mass of 55.0 grams and a density of 11.4 g/cm^3. What is the volume of the ball?
A) 0.207 mL
B) 0.207 L
C) 4.82 mL
D) 4.82 L
E) none of the above
Answer: C
Diff: 2 Page Ref: 2.9
Learning Outcome: 2.11
Global Outcome: G4

Copyright © 2015 Pearson Education, Inc.

62) Given the density of Au is 19.3 g/cm^3, determine the mass of gold (in grams) in an ingot with the dimensions of 10.0 in × 4.00 in × 3.00 in.
A) 3.80×10^4
B) 102
C) 2.32×10^3
D) 0.161
E) none of the above
Answer: A
Diff: 2 Page Ref: 2.9
Learning Outcome: 2.11
Global Outcome: G4

63) What is the density (g/mL) of an object that has a mass of 14.01 grams and, when placed into a graduated cylinder, causes the water level to rise from 25.2 mL to 33.6 mL?
A) 0.60
B) 1.7
C) 1.8
D) 2.4
E) none of the above
Answer: B
Diff: 3 Page Ref: 2.9
Learning Outcome: 2.10a
Global Outcome: G9

64) An object weighing 1.840 kg has a volume of 0.0015 m^3. What is the density of the object in g/cm^3?
A) 1.2
B) 0.0012
C) 0.82
D) 0.0028
E) none of the above
Answer: A
Diff: 3 Page Ref: 2.9
Learning Outcome: 2.10a
Global Outcome: G4

Copyright © 2015 Pearson Education, Inc.

65) Given the following list of densities, which materials would float in a molten vat of lead provided that they do not themselves melt? Densities (g/mL): lead = 11.4, glass = 2.6, gold = 19.3, charcoal = 0.57, platinum = 21.4.
A) gold and platinum
B) glass and charcoal
C) gold, platinum, glass and coal
D) gold and charcoal
E) none of the above
Answer: B
Diff: 2 Page Ref: 2.9
Learning Outcome: 2.10a
Global Outcome: G9

66) A popular science demonstration is to take several liquids that will not mix together and "stack" these liquids in a tall glass cylinder. Suppose the following three liquids were placed in the same tall, narrow glass cylinder:

SUBSTANCE	DENSITY g/mL
vinegar	1.01
motor oil	0.87
corn syrup	1.36

These liquids would stack in which order?
A) corn syrup on top, motor oil in the middle, vinegar on the bottom
B) vinegar on top, motor oil in the middle, corn syrup on the bottom
C) motor oil on top, corn syrup in the middle, vinegar on the bottom
D) corn syrup on top, vinegar in the middle, motor oil on the bottom
E) motor oil on top, vinegar in the middle, corn syrup on the bottom
Answer: E
Diff: 2 Page Ref: 2.9
Learning Outcome: 2.10a
Global Outcome: G3|G9

Copyright © 2015 Pearson Education, Inc.

67) The distance from New York City to Washington, DC is approximately 235 miles. Identify the correct solution map to convert from miles to kilometers using the prefix multipliers and the given conversion factors: 1 mile = 5280 ft; 1 ft = 12 in; 1 in = 2.54 cm.

A) $235 \text{ mile} \times \frac{1 \text{ ft}}{5280 \text{ mile}} \times \frac{12 \text{ in}}{1 \text{ ft}} \times \frac{1 \text{ in}}{2.54 \text{ cm}} \times \frac{10^{-2} \text{ cm}}{1 \text{ m}} \times \frac{1 \text{ km}}{10^{3} \text{ m}}$

B) $235 \text{ mile} \times \frac{5280 \text{ ft}}{1 \text{ mile}} \times \frac{1 \text{ ft}}{12 \text{ in}} \times \frac{2.54 \text{ in}}{1 \text{ ft}} \times \frac{1 \text{ m}}{10^{-2} \text{ cm}} \times \frac{10^{3} \text{ km}}{1 \text{ m}}$

C) $235 \text{ mile} \times \frac{5280 \text{ ft}}{1 \text{ mile}} \times \frac{12 \text{ in}}{1 \text{ ft}} \times \frac{2.54 \text{ cm}}{1 \text{ in}} \times \frac{10^{-2} \text{ m}}{1 \text{ cm}} \times \frac{1 \text{ km}}{10^{3} \text{ m}}$

D) $235 \text{ mile} \times \frac{12 \text{ in}}{1 \text{ ft}} \times \frac{1 \text{ in}}{2.54 \text{ cm}} \times \frac{10^{-2} \text{ cm}}{1 \text{ m}} \times \frac{1 \text{ km}}{10^{3} \text{ m}}$

E) $235 \text{ mile} \times \frac{12 \text{ in}}{1 \text{ ft}} \times \frac{2.54 \text{ cm}}{1 \text{ in}} \times \frac{1 \text{ m}}{10^{-2} \text{ cm}} \times \frac{10^{3} \text{ km}}{1 \text{ m}}$

Answer: C
Diff: 3 Page Ref: 2.10
Learning Outcome: 2.8
Global Outcome: G4

68) The Olympic Games shot put field event uses a 16 pound (lb) shot. Identify the correct solution map to convert from pounds to kilograms using prefix multipliers and the given conversions of $16 \text{ oz} = 1 \text{ lb}$ and $453.6 \text{ g} = 16 \text{ oz}$.

A) $16 \text{ lb} \times \frac{1 \text{ lb}}{16 \text{ oz}} \times \frac{16 \text{ oz}}{453.6 \text{ g}} \times \frac{10^{3} \text{ g}}{1 \text{ kg}}$

B) $16 \text{ lb} \times \frac{16 \text{ oz}}{1 \text{ lb}} \times \frac{453.6 \text{ g}}{16 \text{ oz}} \times \frac{10^{3} \text{ kg}}{1 \text{ g}}$

C) $16 \text{ lb} \times \frac{16 \text{ oz}}{1 \text{ lb}} \times \frac{453.6 \text{ g}}{16 \text{ oz}} \times \frac{1 \text{ kg}}{10^{3} \text{ g}}$

D) $16 \text{ lb} \times \frac{1 \text{ oz}}{16 \text{ lb}} \times \frac{453.6 \text{ g}}{16 \text{ oz}} \times \frac{1 \text{ kg}}{10^{3} \text{ g}}$

Answer: C
Diff: 3 Page Ref: 2.10
Learning Outcome: 2.8
Global Outcome: G4

Copyright © 2015 Pearson Education, Inc.

69) Metals expand to a larger volume when heated. If a piece of metal was heated, which one of the following statements would be TRUE?
A) The newly calculated density value of the metal would not change from the initial value.
B) The newly calculated density value would decrease.
C) The newly calculated density value would increase.
D) The mass of the metal would also increase.
E) none of the above
Answer: B
Diff: 2 Page Ref: 2.9
Learning Outcome: 2.10a
Global Outcome: G2

70) The jet fuel in an airplane has a mass of 97.5 kg and a density of 0.804 g/cm^3. What is the volume of this jet fuel?
A) 7.84×10^{-2} cm^3
B) 7.84×10^{4} cm^3
C) 1.21×10^{2} cm^3
D) 1.21×10^{5} cm^3
E) none of the above
Answer: D
Diff: 3 Page Ref: 2.9
Learning Outcome: 2.11
Global Outcome: G2

Copyright © 2015 Pearson Education, Inc.

Algorithmic Questions

1) The exponential 10^4 is equal to which decimal number?
A) 10,000
B) 1
C) 10
D) 100
E) none of the above
Answer: A
Diff: 1 Page Ref: 2.2
Learning Outcome: 2.1
Global Outcome: G4

2) The decimal value 10 is equal to which exponential?
A) 10^4
B) 10^3
C) 10^2
D) 10^1
E) none of the above
Answer: D
Diff: 1 Page Ref: 2.2
Learning Outcome: 2.1
Global Outcome: G4

3) The decimal value 0.01 is equal to which exponential?
A) 10^{-3}
B) 10^{-2}
C) 10^{-4}
D) 10^{-5}
E) none of the above
Answer: B
Diff: 1 Page Ref: 2.2
Learning Outcome: 2.1
Global Outcome: G4

Copyright © 2015 Pearson Education, Inc.

4) The exponential 10^{-3} is equal to which decimal number?
A) 0.1
B) 0.001
C) -0.00001
D) -0.0001
E) none of the above
Answer: B
Diff: 1 Page Ref: 2.2
Learning Outcome: 2.1
Global Outcome: G4

5) How would the number 8,155 be written in scientific notation?
A) 8.155×10^{3}
B) 8.155×10^{-1}
C) 8.155×10^{1}
D) 8.155×10^{-3}
E) none of the above
Answer: A
Diff: 1 Page Ref: 2.2
Learning Outcome: 2.1
Global Outcome: G4

6) How would the number 1.09×10^{1} be expressed in decimal form?
A) 109
B) 0.109
C) 1.09
D) 10.9
E) none of the above
Answer: D
Diff: 1 Page Ref: 2.2
Learning Outcome: 2.1
Global Outcome: G4

7) How many significant figures are in the number 2903?
A) 2
B) 5
C) 4
D) 3
E) none of the above
Answer: C
Diff: 1 Page Ref: 2.3
Learning Outcome: 2.3
Global Outcome: G1

Copyright © 2015 Pearson Education, Inc.

8) How many significant figures are represented by the following number that is written in scientific notation? 2.5×10^3
A) 0
B) 1
C) 2
D) 3
E) none of the above
Answer: C
Diff: 2 Page Ref: 2.3, 2.4
Learning Outcome: 2.3
Global Outcome: G4

9) When rounding the number 2.348615 to 4 significant figures, what is the correct value?
A) 2.3490
B) 2.340
C) 2.349
D) 2.348
E) none of the above
Answer: C
Diff: 2 Page Ref: 2.4
Learning Outcome: 2.3
Global Outcome: G1

10) How many significant figures should be reported in the answer to the following calculation?
$(1.40) \times (17.1) =$
A) 0
B) 1
C) 2
D) 3
E) none of the above
Answer: D
Diff: 2 Page Ref: 2.4
Learning Outcome: 2.4
Global Outcome: G4

11) How many significant figures should be reported in the answer to the following calculation?
$(8.50) \times (29.0) \times (1.0947) =$
A) 3
B) 2
C) 4
D) 5
E) none of the above
Answer: A
Diff: 2 Page Ref: 2.4
Learning Outcome: 2.4
Global Outcome: G4

Copyright © 2015 Pearson Education, Inc.

12) How many significant figures should be reported in the answer to the following calculation?
$\frac{(13.21)\ (14.021)}{(2.00)}$ =
A) 3
B) 4
C) 2
D) 5
E) none of the above
Answer: A
Diff: 2 Page Ref: 2.4
Learning Outcome: 2.4
Global Outcome: G4

13) How many significant figures should be reported in the answer to the following calculation?
(4.921) + (16.2) =
A) 3
B) 2
C) 1
D) 4
E) none of the above
Answer: A
Diff: 2 Page Ref: 2.4
Learning Outcome: 2.5
Global Outcome: G4

14) How many significant figures should be reported in the answer to the following calculation?
(43.980) × (19.0023 + 25) =
A) 3
B) 2
C) 4
D) 1
E) none of the above
Answer: B
Diff: 2 Page Ref: 2.4
Learning Outcome: 2.6
Global Outcome: G4

15) The prefix *micro* represents which multiplier?
A) 0.000001
B) 1,000,000
C) 0.001
D) 1,000
E) none of the above
Answer: A
Diff: 1 Page Ref: 2.5
Learning Outcome: 2.7
Global Outcome: G1

Copyright © 2015 Pearson Education, Inc.

16) The multiplier 0.01 is represented by which prefix?
A) kilo-
B) deci-
C) centi-
D) milli-
E) none of the above
Answer: C
Diff: 1 Page Ref: 2.5
Learning Outcome: 2.7
Global Outcome: G1

17) The metric prefix k would be presented as 10 to the power of:
A) -3
B) 3
C) 12
D) -9
Answer: B
Diff: 2 Page Ref: 2.6
Learning Outcome: 2.7
Global Outcome: G1

18) How many inches are in 6.32 cm?
A) 16.1
B) 2.49
C) 3.78
D) 8.86
E) none of the above
Answer: B
Diff: 2 Page Ref: 2.6
Learning Outcome: 2.8
Global Outcome: G4

19) How many in^3 are in 2.20 cm^3?
A) 36.1
B) 10.6
C) 0.1340
D) 7.45
E) none of the above
Answer: C
Diff: 2 Page Ref: 2.8
Learning Outcome: 2.9
Global Outcome: G4

Copyright © 2015 Pearson Education, Inc.

20) What is the density of 96 mL of a liquid that has a mass of 90.5 g?
A) 0.94 g/mL
B) 1.1 g/mL
C) 186.5 g/mL
D) 28.4 g/mL
E) none of the above
Answer: A
Diff: 2 Page Ref: 2.9
Learning Outcome: 2.10a
Global Outcome: G4

21) What is the volume of 19.6 g of a liquid that has a density of 0.967 g/mL?
A) 16.9 mL
B) 20.3 mL
C) 14.7 mL
D) 17.9 mL
E) none of the above
Answer: B
Diff: 2 Page Ref: 2.9
Learning Outcome: 2.11
Global Outcome: G4

Copyright © 2015 Pearson Education, Inc.