General Organic and Biological Chemistry 1st edition Owens Test Bank

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General, Organic, and Biological Chemistry, 1e **(Owens)**
Chapter 2 Measurement in Science and Medicine

2.1 Multiple-Choice Questions

1) Written in scientific notation, 540 000 is
A) 0.54×10^{6}.
B) 54×10^{8}.
C) 5.4×10^{-5}.
D) 5.4×10^{5}.
E) 5.4.
Answer: D
Objective: 2.2
Global Outcomes: G2

2) Written in scientific notation, 8300 is
A) 8.3×10^{2}.
B) 8.3×10^{3}.
C) 8.3×10^{4}.
D) 8.3×10^{-3}.
E) 8.3×10^{-2}.
Answer: B
Objective: 2.2
Global Outcomes: G2

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3) Written in scientific notation, 0.000 000 33 is
A) 3.3×10^{7}.
B) 3.3×10^{-7}.
C) 3.3×10^{-8}.
D) 3.3×10^{8}.
E) 3.3.
Answer: B
Objective: 2.2
Global Outcomes: G2

4) Written in scientific notation, 0.000 004 03 is
A) 4.03×10^{-7}.
B) 4.03×10^{-6}.
C) 4.03×10^{6}.
D) 0.403×10^{-5}.
E) 4.03.
Answer: B
Objective: 2.2
Global Outcomes: G2

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5) The SI base unit for length is the
A) meter.
B) inch.
C) millimeter.
D) kilometer.
E) foot.
Answer: A
Objective: 2.1
Global Outcomes: G2

6) The metric unit for volume is the
A) meter.
B) quart.
C) liter.
D) pint.
E) centimeter.
Answer: C
Objective: 2.1
Global Outcomes: G2

7) Which of the following is the basic unit of mass in the SI?
A) pound
B) kilogram
C) milligram
D) microgram
E) gram
Answer: B
Objective: 2.1
Global Outcomes: G2

8) Which of the following is a measurement of mass in the metric system?
A) milliliter
B) centimeter
C) kilogram
D) Celsius
E) meter
Answer: C
Objective: 2.1
Global Outcomes: G2

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9) Which of the following is a measurement of temperature in the metric system?
A) degree Fahrenheit
B) lb
C) degree Celsius
D) kilogram
E) meter
Answer: C
Objective: 2.1
Global Outcomes: G2

10) A value of 25°C is a measurement of
A) distance.
B) volume.
C) temperature.
D) mass.
E) density.
Answer: C
Objective: 2.1
Global Outcomes: G2

11) A value of 36 mL is a measure of
A) density.
B) mass.
C) temperature.
D) volume.
E) distance.
Answer: D
Objective: 2.1
Global Outcomes: G2

12) A value of 345 cm is a measure of
A) density.
B) mass.
C) temperature.
D) volume.
E) distance.
Answer: E
Objective: 2.1
Global Outcomes: G2

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13) The amount of space occupied by a substance is its
A) mass.
B) density.
C) weight.
D) length.
E) volume.
Answer: E
Objective: 2.1
Global Outcomes: G2

14) The measurement of the gravitational pull on an object is its
A) volume.
B) weight.
C) mass.
D) length.
E) size.
Answer: B
Objective: 2.1
Global Outcomes: G2

15) Significant figures are important because they indicate
A) the exact numbers in a measurement.
B) the number of digits on a calculator.
C) the number of measurements.
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D) the certain and estimated digits in a measurement.
E) the accuracy of the conversion factor.
Answer: D
Objective: 2.2
Global Outcomes: G2

16) Which of the following measurements has three significant figures?
A) 0.005 m
B) 510 m
C) 0.510 m
D) 0.051 m
E) 5100 m
Answer: C
Objective: 2.2
Global Outcomes: G2

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17) Which of the following measured numbers contains the designated CORRECT number of significant figures?
A) 0.04300 5 significant figures
B) 0.00302 2 significant figures
C) 156 000 3 significant figures
D) 1.04 2 significant figures
E) 3.0650 4 significant figures
Answer: C
Objective: 2.2
Global Outcomes: G2

18) The number of significant figures in the measurement of 45.030 mm is
A) none.
B) three.
C) four.
D) five.
E) six.
Answer: D
Objective: 2.2
Global Outcomes: G2

19) How many significant figures are in the measured number 0.00208 m?
A) six
B) two
C) three
D) four
E) five
Answer: C
Objective: 2.2
Global Outcomes: G2

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20) Which of the following examples illustrates a number that is correctly rounded to three significant figures?
A) 4.05438 grams to 4.054 grams
B) 0.03954 grams to 0.040 grams
C) 103.692 grams to 103.7 grams
D) 109 526 grams to 109 500 grams
E) 20.0332 grams to 20.0 grams
Answer: E
Objective: 2.2
Global Outcomes: G2

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21) A calculator answer of 423.6059 must be rounded off to three significant figures. What answer is reported?
A) 423
B) 424
C) 420
D) 423.6
E) 423.7
Answer: B
Objective: 2.3
Global Outcomes: G2

22) Which of the answers for the following calculations contains the correct number of significant figures?
A) $2.543\ \text{m} \times \frac{39.4\ \text{in}}{1\ \text{m}} = 100.1942\ \text{in}$

B) $2\ \text{L} \times \frac{1.06\ \text{qt}}{1\ \text{L}} = 2.12\ \text{qt}$

C) $24.95\ \text{min} \times \frac{1\ \text{h}}{60\ \text{min}} = 0.4158\ \text{h}$

D) $12.0\ \text{ft} \times \frac{12\ \text{in.}}{1\ \text{ft}} \times \frac{2.54\ \text{cm}}{1\ \text{in}} = 370\ \text{cm}$

E) $24.0\ \text{kg} \times \frac{1\ \text{lb}}{2.20\ \text{kg}} = 11\ \text{lb}$

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Answer: C
Objective: 2.2
Global Outcomes: G2

23) What is the correct answer for the calculation of a volume (in mL) with measured numbers $\frac{28.58}{16 \times 8.02}$?
A) 0.22 mL
B) 0.223 mL
C) 57 mL
D) 14 mL
E) 14.3 mL
Answer: A
Objective: 2.2
Global Outcomes: G2

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24) A researcher added three samples of sodium chloride solution; the volumes were: 0.351 mL, 0.350 mL and 0.349 mL. The total volume should be reported as
A) 1.05 mL.
B) 1.0 mL.
C) 1.1 mL.
D) 1.050 mL.
E) 1.0500 mL.
Answer: D
Objective: 2.2
Global Outcomes: G2

25) When 2610 + 11.7 + 0.22 are added, which of the following expresses the answer to the correct number of decimal places?
A) 2621.92
B) 2621.9
C) 2621
D) 2620
E) 2600
Answer: D
Objective: 2.2
Global Outcomes: G2

26) What is the answer, with the correct number of decimal places, for this problem?
4.392 g + 102.40 g + 2.51 g =
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A) 109.302 g
B) 109 g
C) 109.3 g
D) 109.30 g
E) 110 g
Answer: D
Objective: 2.2
Global Outcomes: G2

27) The correct answer for the addition of 7.5 g + 2.26 g + 1.311 g + 2 g is
A) 13.071 g.
B) 13 g.
C) 13.0 g.
D) 10 g.
E) 13.1 g.
Answer: B
Objective: 2.2
Global Outcomes: G2

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28) What is the correct answer for the calculation $\frac{36 \times 0.12345}{6.77}$?

A) 0.65645
B) 0.656
C) 0.66
D) 1.52
E) 1.5
Answer: C
Objective: 2.3
Global Outcomes: G2

29) 5.21 cm is the same distance as
A) 0.0521 m.
B) 52.1 dm.
C) 5.21 mm.
D) 0.00521 km.
E) 5210 m.
Answer: A
Objective: 2.3
Global Outcomes: G2

30) Which of the following measurements are NOT equivalent?
A) 25 mg = 0.025 g
B) 183 L = 0.183 kL
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C) 150. ms = 0.150 s
D) 84 cm = 8.4 mm
E) 24 dL = 2.4 L
Answer: D
Objective: 2.1
Global Outcomes: G2

31) In which of the following is the metric unit paired with its correct abbreviation?
A) microgram / mg
B) milliliter / mL
C) centimeter / km
D) kilogram / cg
E) gram / gm
Answer: B
Objective: 2.1
Global Outcomes: G2

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32) Which of the following is the largest unit?
A) millimeter
B) micrometer
C) meter
D) decimeter
E) kilometer
Answer: E
Objective: 2.1
Global Outcomes: G2

33) Which of the following is the smallest unit?
A) gram
B) milligram
C) kilogram
D) decigram
E) microgram
Answer: E
Objective: 2.1
Global Outcomes: G2

34) The cubic centimeter (cm^3 or cc) has the same volume as a
A) cubic inch.
B) cubic liter.
C) milliliter.
D) centimeter.
E) cubic decimeter.
Answer: C
Objective: 2.1
Global Outcomes: G2

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35) 9.31 g is the same mass as
A) 931 µg.
B) 931 kg.
C) 93.1 cg.
D) 9310 mg.
E) 0.0931 dg.
Answer: D
Objective: 2.1
Global Outcomes: G2

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36) What is the conversion factor for the relationship between millimeters and centimeters?
A) 1 mm/1 cm
B) 10 mm/1 cm
C) 1 cm/1 mm
D) 100 mm/1 cm
E) 10 cm/1 mm
Answer: B
Objective: 2.3
Global Outcomes: G2

37) A conversion factor set up correctly to convert 15 inches to centimeters is
A) 100 cm/1 m.
B) 1 inch/2.54 cm.
C) 1 cm/10 mm.
D) 2.54 cm/1 inch.
E) 10 cm/1 inch.
Answer: D
Objective: 2.3
Global Outcomes: G2

38) Which of the following conversion factors is a measured number?
A) 10 cm/dm
B) 12 in/ft
C) 16 oz/lb
D) 25 miles/gallon
E) 12 eggs/dozen
Answer: D
Objective: 2.3
Global Outcomes: G2

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39) According to the United States Food and Drug Administration, the recommended daily requirement of protein is 44 g. This is _____ oz of protein.
A) 1248.5
B) 320 000
C) 1.6
D) 0.0605
E) 150 000
Answer: C
Objective: 2.3
Global Outcomes: G2

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40) Which of the following setups would convert centimeters to feet?

A) $\text{cm} \times \frac{2.54 \text{ in.}}{1 \text{ cm}} \times \frac{1 \text{ ft}}{12 \text{ in.}}$

B) $\text{cm} \times \frac{2.54 \text{ cm}}{1 \text{ in.}} \times \frac{12 \text{ in.}}{1 \text{ ft}}$

C) $\text{cm} \times \frac{1 \text{ in.}}{2.54 \text{ cm}} \times \frac{1 \text{ ft}}{12 \text{ in.}}$

D) $\text{cm} \times \frac{1 \text{ in.}}{2.54 \text{ cm}} \times \frac{12 \text{ in.}}{1 \text{ ft}}$

E) $\text{cm} \times \frac{2.54 \text{ cm}}{1 \text{ in.}} \times \frac{1 \text{ ft}}{12 \text{ in.}}$

Answer: C
Objective: 2.3
Global Outcomes: G2

41) The EPA limit for lead in the soil of play areas is 400 ppm. This is the same as
A) 400 mg lead in each gram of soil.
B) 400 g lead in each kilogram of soil.
C) 400 mg lead in each kilogram of soil.
D) 400 µg lead in each kilogram of soil.
E) 400 µg lead in each milligram of soil.
Answer: C
Objective: 2.3
Global Outcomes: G2

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42) How many pounds are in 3.5 kg?
A) 7.7 lb
B) 1.59 lb
C) 0.629 lb
D) 1.6 lb
E) 7.70 lb
Answer: A
Objective: 2.5
Global Outcomes: G2

43) How many centimeters are there in 57.0 in.?
A) 22 cm
B) 0.0445 cm
C) 145 cm
D) 22.4 cm
E) 140 cm
Answer: C
Objective: 2.3
Global Outcomes: G2

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44) How many kilograms are in 30.4 lb?
A) 13.8 kg
B) 14 kg
C) 67 kg
D) 66.88 kg
E) 66.9 kg
Answer: A
Objective: 2.3
Global Outcomes: G2

45) How many liters of soft drink are there in 5.25 qt?
A) 4950 L
B) 55.7 L
C) 4.97 L
D) 5.57 L
E) 5.0 L
Answer: C
Objective: 2.3
Global Outcomes: G2

46) What is 6.5 m converted to inches?
A) 1700 in
B) 1651 in
C) 39 in
D) 260 in
E) 255.9 in
Answer: D
Objective: 2.3
Global Outcomes: G2

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47) 1.00 pint of milk has a volume of how many milliliters? (2 pints = 1 quart)
A) 473 mL
B) 530. mL
C) 1000 mL
D) 1890 mL
E) 106 mL
Answer: A
Objective: 2.3
Global Outcomes: G2

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48) What is the volume of a cube that measures 4.00 cm on each side?
A) 16.0 mL
B) 64.0 L
C) 64.0 mL
D) 64.00 mL
E) 0.640 L
Answer: C
Objective: 2.3
Global Outcomes: G2

49) Grapes are $1.49 per pound. What is the cost of 1.20 kg of grapes?
A) $3.93
B) $2.73
C) $1.79
D) $0.81
E) $0.56
Answer: A
Objective: 2.3
Global Outcomes: G2

50) A driver is traveling at 60 km/h. Is the driver speeding if the speed limit is 45 mph?
A) Yes
B) No
Answer: B
Objective: 2.3
Global Outcomes: G2

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51) A dose of aspirin of 5.0 mg per kilogram of body weight has been prescribed to reduce the fever of an infant weighing 8.5 pounds. The number of milligrams of aspirin that should be administered is
A) 19 mg.
B) 53 mg.
C) 1.6 mg.
D) 5.0 mg.
E) 0.59 mg.
Answer: A
Objective: 2.4
Global Outcomes: G2

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52) A doctor's order is 0.125 g of ampicillin. The liquid suspension on hand contains 250 mg/5.0 mL. How many milliliters of the suspension are required?
A) 0.0025 mL
B) 3.0 mL
C) 2.5 mL
D) 6.3 mL
E) 0.0063 mL
Answer: C
Objective: 2.4
Global Outcomes: G2

53) A nugget of gold with a mass of 521 g is added to 50.0 mL of water. The water level rises to a volume of 77.0 mL. What is the density of the gold?
A) 10.4 g/mL
B) 6.77 g/mL
C) 1.00 g/mL
D) 0.0518 g/mL
E) 19.3 g/mL
Answer: E
Objective: 2.7
Global Outcomes: G2

54) Which one of the following substances will float in gasoline, which has a density of 0.66 g/mL?
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A) table salt (density = 2.16 g/mL)
B) balsa wood (density = 0.16 g/mL)
C) sugar (density = 1.59 g/mL)
D) aluminum (density = 2.70 g/mL)
E) mercury (density = 13.6 g/mL)
Answer: B
Objective: 2.7
Global Outcomes: G2

55) What is the mass of 2.00 L of an intravenous glucose solution with a density of 1.15 g/mL?
A) 0.023 kg
B) 2.30 kg
C) 1.15 kg
D) 0.015 kg
E) 0.58 kg
Answer: B
Objective: 2.7
Global Outcomes: G2

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56) Mercury has a specific gravity of 13.6. How many milliliters of mercury have a mass of 0.35 kg?
A) 0.0257 mL
B) 0.026 mL
C) 25.7 mL
D) 26 mL
E) 4760 mL
Answer: D
Objective: 2.7
Global Outcomes: G2

57) What is the density of a substance with a mass of 45.00 g and a volume of 26.4 mL?
A) 1.70 g/mL
B) 1.7 g/mL
C) 0.59 g/mL
D) 0.587 g/mL
E) 45.0 g/mL
Answer: A
Objective: 2.7
Global Outcomes: G2

58) A liquid has a volume of 34.6 mL and a mass of 46.0 g. What is the density of the liquid?
A) 1.00 g/mL
B) 1.33 g/mL
C) 0.752 g/mL
D) 1330 g/mL
E) 0.663 g/mL
Answer: B
Objective: 2.7
Global Outcomes: G2

59) What is the mass of 53 mL of ethanol, which has a density of 0.79 g/mL?
A) 67.1 g
B) 41.9 g
C) 42 g
D) 67 g
E) 53 g
Answer: C
Objective: 2.7
Global Outcomes: G2

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60) The density of a solution is 0.847 g/mL. Its specific gravity is
A) 11.8.
B) 0.118.
C) 0.847.
D) 1.18.
E) 1.2.
Answer: C
Objective: 2.7
Global Outcomes: G2

61) The specific gravity of a solution is 1.18. Its density is
A) 11.8 g/mL.
B) 0.118 g/mL.
C) 0.847 g/mL.
D) 1.18 g/mL.
E) 1.2 g/mL.
Answer: D
Objective: 2.7
Global Outcomes: G2

62) Diamond has a density of 3.52 g/mL. What is the volume in cubic centimeters of a diamond with a mass of 15.1 g?
A) 4.3 cm^3
B) 4.29 cm^3
C) 0.233 cm^3
D) 53 cm^3
E) 53.2 cm^3
Answer: B
Objective: 2.7
Global Outcomes: G2

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63) The ratio of the mass of a substance to its volume is its
A) specific gravity.
B) density.
C) buoyancy.
D) weight.
E) conversion factor.
Answer: B
Objective: 2.7
Global Outcomes: G2

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64) A 50.0 mL urine sample has a mass of 50.7 g. The specific gravity of the urine is
A) 1.014 g/mL.
B) 0.986 g/L.
C) 1.01.
D) 0.986.
E) 50.7.
Answer: C
Objective: 2.7
Global Outcomes: G2

65) A temperature of 41 °F is the same as
A) 5 °C.
B) 310 °C.
C) -9 °C.
D) 16 °C.
E) 42 °C.
Answer: A
Objective: 2.6
Global Outcomes: G4

66) If the temperature is 20 °C, what is the corresponding temperature on the Fahrenheit scale?
A) -22 °F
B) 68 °F
C) 43 °F
D) 239 °F
E) 94 °F
Answer: B
Objective: 2.6
Global Outcomes: G4

67) If the temperature is -55 °C, what is the corresponding temperature on the Kelvin scale?
A) 225 K
B) 218 K
C) 55 K
D) 273 K
E) 328 K
Answer: B
Objective: 2.6
Global Outcomes: G4

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68) A patient has a temperature of 38.5 °C. What is the temperature in degrees Fahrenheit?
A) 70.5 °F
B) 311.0 °F
C) 126.9 °F
D) 101.3 °F
E) 11.7 °F
Answer: D
Objective: 2.6
Global Outcomes: G4

69) The temperature of liquid nitrogen is -196 °C. What is the corresponding reading on the Kelvin scale?
A) 77 K
B) -127 K
C) -91 K
D) 48 K
E) 146 K
Answer: A
Objective: 2.6
Global Outcomes: G4

70) On a hot day, the thermometer read 95 °F. What is the temperature in degrees Celsius?
A) 77 °C
B) 113 °C
C) 35 °C
D) 63 °C
E) 178 °C
Answer: C
Objective: 2.6
Global Outcomes: G4

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71) Absolute zero is
A) the freezing point of water using the Celsius scale.
B) the boiling point of liquid nitrogen.
C) the temperature on the Kelvin scale corresponding to 32 °F.
D) the coldest temperature possible.
E) the freezing point of liquid nitrogen.
Answer: D
Objective: 2.6
Global Outcomes: G2

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2.2 Matching Questions

Match the type of measurement to the unit given below.

A) volume
B) mass
C) temperature
D) distance

1) milliliter
Objective: 2.1
Global Outcomes: G2

2) mm
Objective: 2.1
Global Outcomes: G2

3) gram
Objective: 2.1
Global Outcomes: G2

4) K
Objective: 2.1
Global Outcomes: G2

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5) kilometer
Objective: 2.1
Global Outcomes: G2

6) milligram
Objective: 2.1
Global Outcomes: G2

Answers: 1) A 2) D 3) B 4) C 5) D 6) B

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Are the numbers in each of the following statements measured or exact?

A) exact
B) measured

7) In the U.S. system there are 5280 feet in one mile.
Objective: 2.2
Global Outcomes: G2

8) The patient's blood sugar level is 350 mg/dL.
Objective: 2.2
Global Outcomes: G2

9) There are 452 pages in a book.
Objective: 2.2
Global Outcomes: G2

10) The rabbit weighs 2.5 pounds.
Objective: 2.2
Global Outcomes: G2

11) There are 100 capsules in the bottle.
Objective: 2.2
Global Outcomes: G2

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12) I lost 14 pounds on my diet last month.
Objective: 2.2
Global Outcomes: G2

13) 1 liter is equal to 1.06 quarts.
Objective: 2.2
Global Outcomes: G2

14) The patient's temperature is 100.1 °F.
Objective: 2.2
Global Outcomes: G2

Answers: 7) A 8) B 9) A 10) B 11) A 12) B 13) B 14) B

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Select the correct prefix to complete the equality.

A) 100
B) 1000
C) 1×10^{12}
D) 0.001
E) 10
F) 1×10^{-12}
G) 1

15) 1 g = _____ kg
Objective: 2.1
Global Outcomes: G2

16) 1 m = _____ mm
Objective: 2.1
Global Outcomes: G2

17) 1 cm = _____ mm
Objective: 2.1
Global Outcomes: G2

18) 1 dL = _____ Ml
Objective: 2.1
Global Outcomes: G2

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19) 1 kg = _____ g
Objective: 2.1
Global Outcomes: G2

20) 1 pg = _____ g
Objective: 2.1
Global Outcomes: G2

21) 1 g = _____ pg
Objective: 2.1
Global Outcomes: G2

22) 1 mL = _____ cc
Objective: 2.1
Global Outcomes: G2

Answers: 15) D 16) B 17) E 18) A 19) B 20) F 21) C 22) G

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2.3 True/False Questions

1) The basic unit of mass in the metric system is the pound.
Answer: FALSE
Objective: 2.1
Global Outcomes: G2

2) The liter is a unit of volume in the metric system.
Answer: TRUE
Objective: 2.1
Global Outcomes: G2

3) The number 0.0500 has four significant figures.
Answer: FALSE
Objective: 2.2
Global Outcomes: G2

4) The number 650 000 has two significant figures.
Answer: TRUE
Objective: 2.2
Global Outcomes: G2

5) When the measured number 0.0090 is multiplied by the measured number 87.10, the answer has two significant figures.
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Answer: TRUE
Objective: 2.2
Global Outcomes: G2

6) When the measured number 675 is added to the measured number 87.10, the answer should be rounded to the ones place.
Answer: TRUE
Objective: 2.2
Global Outcomes: G2

7) A μg is larger than a mg.
Answer: FALSE
Objective: 2.3
Global Outcomes: G2

8) There are 1000 μg in a mg.
Answer: TRUE
Objective: 2.3
Global Outcomes: G2

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9) A cubic centimeter is a unit of length.
Answer: FALSE
Objective: 2.3
Global Outcomes: G2

10) 1 kilogram is the same as 1000 mg.
Answer: FALSE
Objective: 2.3
Global Outcomes: G2

11) 1 milliliter is the same as 1000 L.
Answer: FALSE
Objective: 2.3
Global Outcomes: G2

12) The density of water is 1 kg/mL.
Answer: FALSE
Objective: 2.7
Global Outcomes: G2

13) Specific gravity has no units.
Answer: TRUE
Objective: 2.7
Global Outcomes: G2

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14) Water freezes at 100 °C.
Answer: FALSE
Objective: 2.6
Global Outcomes: G2

15) 32 °F is the same temperature as 100 °C.
Answer: FALSE
Objective: 2.6
Global Outcomes: G2

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