

MULTIPLE CHOICE

1. **The mass of an object is**

- a. the force between the object and the earth.
- b. a measure of the amount of matter in the object.
- c. the amount of space the object occupies.
- d. depends on the location of the object on the earth.

ANS: B PTS: 1

2. **Any two objects are attracted to each other by _____.**

- a. gravity
- b. electrostatic forces
- c. magnetism
- d. all of them

ANS: A PTS: 1

3. **How is the weight of an object influenced when the gravitational force on the object is increased?**

- a. it decreases
- b. it increases
- c. it is unchanged
- d. it equals the mass

ANS: B PTS: 1

4. **The weight of an object is**

- a. a measure of the gravitational force pulling the object toward the earth.
- b. equal to the mass of the matter in the object.
- c. a measure of the space occupied by the object.
- d. the same at any location on the earth.

ANS: A PTS: 1

5. **The fact that gold does not corrode is a _____ property**

- a. physical
- b. personal
- c. real
- d. chemical

ANS: D PTS: 1

6. **Which of the following represents a physical change in matter?**

- a. A substance solidifies at 443 K.
- b. A substance produces a gas and a solid when heated.
- c. A substance burns when heated.
- d. A substance changes color when exposed to air.

ANS: A PTS: 1

7. **The melting of ice to liquid water is correctly classified as**

- a. a chemical change.
- b. a physical change.
- c. both a chemical and a physical change.
- d. neither a chemical nor physical change.

ANS: B PTS: 1

8. **Which of the following is a physical property of matter?**

- a. it does not burn
- b. produces a gas when placed in an acid
- c. freezes at -10°F
- d. the surface turns black in air

ANS: C PTS: 1

9. **Which of the following is a chemical property of matter?**

- a. color
- b. density
- c. freezing point
- d. flammability

ANS: D PTS: 1

10. **As two clear liquid solutions are thoroughly mixed, a red solid forms. This change is most likely _____ .**

- a. physical.
- b. chemical.
- c. neither chemical nor physical.
- d. both chemical and physical.

ANS: B PTS: 1

11. **The limit of chemical subdivision of an element is the _____ .**

- a. atom
- b. molecule
- c. proton
- d. compound

ANS: A PTS: 1

12. **Which of the following substances are composed of heteroatomic molecules?**

- a. an iron nail
- b. oxygen
- c. copper wire
- d. water

ANS: D PTS: 1

13. **A molecule represented by O-O-O must be classified as**

- a. homoatomic and polyatomic.
- b. homoatomic and monoatomic.
- c. heteroatomic and polyatomic.
- d. heteroatomic and monoatomic.

ANS: A PTS: 1

14. **Which of the following terms correctly applies to a molecule of CO_2 ?**

- a. triatomic, heteroatomic
- b. polyatomic, diatomic
- c. triatomic, homoatomic
- d. diatomic, heteroatomic

ANS: A PTS: 1

15. **Table salt, NaCl is best classified as a(n) _____ .**

- a. compound
- b. element
- c. homogeneous mixture
- d. heterogeneous mixture

ANS: A PTS: 1

16. **The limit of physical subdivision of pure H_2O is _____ .**

- a. the atom
- b. the molecule
- c. the element
- d. a proton

ANS: B PTS: 1

17. **Homoatomic pure substances are known as _____ .**

- a. protons
- b. elements
- c. compound
- d. molecules

ANS: B PTS: 1

18. **After heating, a pure substance, A, is found to produce both B and C. What can be said about the substance A?**
- a. It is an element
 - b. It is a compound
 - c. It is either an element or compound
 - d. Impossible to predict
- ANS: B PTS: 1
19. **Two pure substances A and B react to form a new pure substance C. From this, we may conclude that**
- a. A and B are both elements
 - b. C is a compound, A and B may or may not be elements
 - c. C is an element, A and B are compounds
 - d. A, B, and C are all compounds
- ANS: B PTS: 1
20. **Which of the following is an example of a homogeneous mixture?**
- a. NaOH solution
 - b. mortar (mixture of water, sand and cement)
 - c. vinegar and oil salad dressing
 - d. more than one response is correct
- ANS: A PTS: 1
21. **Which of the following consists of a single chemical species?**
- a. solution
 - b. homogeneous mixture
 - c. heterogeneous mixture
 - d. compound
- ANS: D PTS: 1
22. **Early measurements of length were based on**
- a. dimensions of astronomical bodies.
 - b. dimensions of the human body.
 - c. dimensions of bodies of water.
 - d. distances between cities.
- ANS: B PTS: 1
23. **The metric system is a measurement system that is**
- a. the official system for all nations of the world.
 - b. only used by a few of the nations of the world.
 - c. commonly used by U.S. physical scientists.
 - d. used exclusively in chemical calculations.
- ANS: C PTS: 1
24. **The basic unit of length in the metric system is the ____ .**
- a. mil
 - b. millimeter
 - c. foot
 - d. meter
- ANS: D PTS: 1
25. **Which of the following is an SI unit?**
- a. gram
 - b. liter
 - c. meter
 - d. calorie
- ANS: C PTS: 1
26. **The prefix centi- denotes what fraction of a basic unit?**

- a. 1/10 b. 1/100 c. 1/1000 d. 1000

ANS: B PTS: 1

27. Which of the following is a derived unit of the S.I. system?

- a. kilogram b. meter c. liter d. mole

ANS: C PTS: 1

28. Convert a temperature of 76°F to a Celsius value.

- a. 10 b. 24 c. 44 d. 169

ANS: B PTS: 1

29. Which of the following numbers is correctly expressed using scientific notation?

- a. 3489 b. 5.248×10^4 c. 45.78×10^6 d. $.0987 \times 10^3$

ANS: B PTS: 1

30. Do the following calculation and express the answer using correct scientific notation.

- a. 5.53×10^3 b. 1.81×10^{-4} c. 4.88×10^8 d. 2.05×10^{-9}
- $\text{_____} = (2.97 \times 10^2) \times (6.09 \times 10^{-7})$

ANS: B PTS: 1

31. Do the following calculation, and express the answer using correct scientific notation.

- a. 6.34×10^{21} b. 1.58×10^{-22} c. 6.34×10^{-2} d. 15.8
- $\text{_____} = (6.00 \times 10^{23}) \times (3.00) / (284)$

ANS: A PTS: 1

32. The number 0.00816 expressed correctly using scientific notation is _____.

- a. 8.16×10^2 b. 8.16×10^3 c. 8.16×10^{-2} d. 8.16×10^{-3}

ANS: D PTS: 1

33. How many significant figures are justified in a measurement of a length that is between 9 and 10 centimeters if the measuring device (ruler) has smallest divisions of 0.1 cm?

- a. one b. two c. three d. four

ANS: C PTS: 1

34. How many significant figures are used in expressing a measurement as 0.2503 L?

- a. one b. two c. three d. four

ANS: D PTS: 1

35. Which number has the greatest number of significant digits?

- a. 1.0035 b. 17.5000 c. 0.0000625 d. 6.022×10^{23}

ANS: B PTS: 1

36. Do the following calculation and express the answer using the correct number of significant figures. _____ = $(342) \times (0.0012) \div 100.0$

- a. 0.00410 b. 0.0041 c. 4.10×10^{-3} d. 0.004104

ANS: B PTS: 1

37. Do the following calculation. How many significant figures are justified for the answer? _____ = $6.02 + 5.119 + 0.04218$
a. three b. four c. five d. seven

ANS: B PTS: 1

38. A furnace delivers 8.0×10^4 BTU per hour. How many kilocalories per hour is this? (hint: 1 cal = 0.00397 BTU)
a. 3.2×10^{-5} kcal c. 2.0×10^4 kcal
b. 3.2×10^2 kcal d. 2.5×10^2 kcal

ANS: C PTS: 1

39. Which of the following set-ups will allow you to calculate the cost of fruit in dollars per gram, if the price is given as 0.79 dollars per pound?
- a. $\frac{0.79 \text{ dollars}}{\text{lb}} \times \frac{2.20 \text{ lb}}{1000 \text{ g}}$ c. $\frac{\text{lb}}{0.79 \text{ dollars}} \times \frac{1 \text{ lb}}{457 \text{ g}}$
b. $\frac{0.79 \text{ dollars}}{\text{lb}} \times \frac{457 \text{ g}}{1 \text{ dollar}}$ d. $\frac{\text{lb}}{0.79 \text{ dollars}} \times \frac{1 \text{ kg}}{2.20 \text{ lb}}$

ANS: A PTS: 1

40. An entry wound is found to be 0.36 inch in diameter. Which of the following guns was likely to have been used?
a. 9 mm Beretta c. 200 mm Howitzer
b. 12 mm Uzi d. 0.5 cm pellet gun

ANS: A PTS: 1

41. Suppose the speedometer in your car reads 55.0 mph. What is your speed in km/hr? (1 km = 0.621 mi.)
a. 34.1 b. 0.029 c. 88.6 d. 0.011

ANS: C PTS: 1

42. Knowing that 1 g = 0.035 oz and 16 ounces = 1 lb, calculate the number of grams in 10 pounds.
a. 35 b. 0.56 c. 1.8 d. 4.6×10^3

ANS: D PTS: 1

43. If a student completes 5 problems out of a total of 8 on a pop quiz, what percentage of the quiz was completed?
a. 0.625 b. 6.25 c. 16.0 d. 62.5

ANS: D PTS: 1

44. If 13% of a class cheats on an exam and there are 93 students in the class, how many students should you recommend be expelled (to the nearest whole student)?
a. 9 b. 10 c. 12 d. 15

ANS: C PTS: 1

45. **A hiker began a hike with a pint canteen full of water. One pint equals 16 fluid ounces. At the end of the hike, 7.0 fluid ounces of water remained. What percent of the water was *used* during the hike?**

a. 78 b. 44 c. 56 d. 13

ANS: C PTS: 1

46. **Eighteen students in a class will get this question correct. If that represents 45% of the class, how large is the class?**

a. 20 b. 40 c. 60 d. 100

ANS: B PTS: 1

47. **If urine has a density of 1.08 g/mL, what would be the mass of a 125 mL urine sample?**

a. 135 g b. 0.00864 g c. 116 g d. 125 g

ANS: A PTS: 1

48. **You are able to carry a maximum of 20 kg. What is the maximum volume of gold that you can carry? (Au has a density of 19.6 g/cm³)**

a. 392 cm³ b. 1.0×10^3 cm³ c. 0.98 cm³ d. none of these

ANS: B PTS: 1

49. **The fact that iron (Fe) corrodes when exposed to water and air is a**

a. physical property. c. chemical property.
b. metal property. d. real property.

ANS: C PTS: 1

50. **Convert 30.0°C to Fahrenheit.**

a. 112 b. 86.0 c. 48.7 d. 34.4

ANS: B PTS: 1

51. **Which of the following is not one of the five key body characteristics that provide a good assessment of a person's overall health?**

a. blood pressure c. body fat
b. blood cholesterol d. age

ANS: D PTS: 1

52. **How can the volume of an irregular unknown object be measured?**

a. using a ruler to measure length, width, and depth
b. measuring the volume of water displaced by the object
c. obtaining the mass of the object
d. measure the radius and use $V = \pi r^2$

ANS: B PTS: 1

53. **Do the following calculation and express the answer using the correct number of significant figures.**

_____ = $(1.21 \times 10^{-3} + 1.3 \times 10^{-3}) \times 6.453 \times 10^2$
a. 1.619 b. 2 c. 1.6 d. 1.62

ANS: C PTS: 1

54. If a sample of blood was found to have a density of 1.05 g/mL, what would be the mass of 1.000 liters of this material? Express your answer with the proper number of significant figures.

a. 1.05×10^{-3} g b. 1.05×10^3 g c. 1050 g d. 1.050 kg

ANS: B PTS: 1

55. On a cold winter day the weather report gives the temperature as -5.0°F . What would this temperature be if reported on the Kelvin scale?

a. 252 K b. 258 K c. 268 K d. -20.6 K

ANS: A PTS: 1

56. Express the following "generic" number in standard notation. $X.XX \times 10^4$

a. 0.000XXX b. XX,X00 c. X,XX0 d. 0.00XXX

ANS: B PTS: 1

57. Express the following "generic number" in scientific notation. 0.0000XXX

a. $XXX \times 10^{-7}$ b. $X.XX \times 10^5$ c. $X.XX \times 10^{-5}$ d. $X.XX \times 10^{-4}$

ANS: C PTS: 1

58. The density of zinc is 7.13 g/cm^3 . What is the mass in kilograms of a 125 cm^3 cylinder of zinc?

a. 891 kg b. 17.5 kg c. 0.0175 kg d. 0.891 kg

ANS: D PTS: 1

59. Ethanol (ethyl alcohol) has a density of 0.789 g/mL at 25°C . If 75.5 g of ethanol is needed for a reaction, what volume in mL should be added to the reaction container?

a. 95.7 mL b. 59.6 mL c. 0.0105 mL d. 78.9 mL

ANS: A PTS: 1

60. Based on data obtained in an experiment, to determine the density of a metal, the following calculation is carried out. Express the answer to the correct number of significant figures.

$$\frac{57.675\text{ g} - 3.047\text{ g}}{25.65\text{ mL} - 0.15\text{ mL}} = 2.1422745098\text{ g/mL}$$

a. 2.1 g/mL b. 2.14 g/mL c. 2.142 g/mL d. 2.1423 g/mL

ANS: C PTS: 1

61. You are saving for a new \$1226 (including taxes) laptop computer using earnings from your part-time job. At that job, you work 20 hours/week, earning \$10.25/hour take home pay. If you can save 25% of all of your income, how many weeks will it take for you to save enough money?

a. 48 weeks b. 24 weeks c. 12 weeks d. 6 weeks

ANS: B PTS: 1

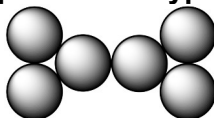
62. It turns out that the dark side of the moon has as a mean temperature of -280°F . What would that the temperature be on the Kelvin scale?

a. -553 K b. -7 K c. 100 K d. 173 K

ANS: C

PTS: 1

63. The figure shown below is an example of what type of molecule?



- a. homoatomic, triatomic
- b. heteroatomic, polyatomic
- c. homoatomic, polyatomic
- d. heteroatomic, triatomic

ANS: C

PTS: 1

64. Which of the following properties is characteristic of a mixture?

- a. constant composition
- b. variation of physical properties
- c. fixed melting point.
- d. cannot be physically separated into simpler materials

ANS: B

PTS: 1

65. The average gestation period (length of a pregnancy) for humans is 40 weeks. If a child is born after just 36 weeks, what was the percentage of this gestation period compared to the normal length?

- a. 4.0 %
- b. 10 %
- c. 28 %
- d. 90 %

ANS: B

PTS: 1

66. One system of rating food is to determine its energy density in kcal/g. If your 200 g snack contains 100 g fat (900 cal/g) and a total of 100 g of protein and carbohydrates (400 cal/gram). what is its energy density?

- a. 1.3 kcal/g
- b. 6.5 kcal/g
- c. 9.0 kcal/g
- d. 13 kcal/g

ANS: B

PTS: 1

TRUE/FALSE

1. The number twelve, representing a dozen, has two significant figures.

ANS: T

PTS: 1

2. The number 6730.0 contains five significant figures.

ANS: T

PTS: 1

3. If 3333 is divided by 5.0, the answer should have two significant figures.

ANS: T

PTS: 1

4. If 6526 is added to 15.0, the answer should have two significant figures.

ANS: F

PTS: 1

5. To convert feet to inches, you should multiply by the factor 12 in./ft.

ANS: T PTS: 1

6. **To convert micrograms to grams, you should multiply by 1,000,000 g/microgram.**

ANS: F PTS: 1

7. **To convert microliters to liters, you should multiply by 1 liter/1,000,000 microliters.**

ANS: T PTS: 1

8. **If a 50 gram sample of iron alloy contains 40 grams of iron, it contains 80% iron by weight.**

ANS: T PTS: 1

9. **If 100 people in a town of 5,000 people own a certain color car, this represents 0.1% of the population.**

ANS: F PTS: 1

10. **If a 200 gram sample of water is partially frozen forming 40 g of ice, then 80% of the original sample is still a liquid.**

ANS: T PTS: 1

11. **A sample of urine is measured to have the density of 1.15 g/mL which is an indicator that there may be a medical problem.**

ANS: T PTS: 1

12. **A patient weighs 220 lbs. A medication for this patient is supposed to be taken 3 mg per kg per day. The correct dose for this patient is 3000 mg per day.**

ANS: F PTS: 1

13. **A particular medication is a heterogeneous mixture. Since heterogeneous mixtures are consistent throughout, this medication does not need to be shaken.**

ANS: F PTS: 1

14. **A Celsius degree is the same size as a Kelvin degree.**

ANS: T PTS: 1

15. **One advantage of the Kelvin system is that it is impossible to have temperatures below zero.**

ANS: T PTS: 1

16. **If the first ingredient on the label of a cosmetic is "active ingredient", the cosmetic is also regulated as a drug.**

ANS: T PTS: 1

17. **Henna is a hair coloring that causes a permanent change in color until the hair grows out. Henna is regulated as both a drug and a cosmetic because the change is permanent.**

ANS: F PTS: 1

18. **Body density can be used to determine the amount of fat carried by an individual because the density of muscle is greater than that of fat.**

ANS: T PTS: 1

19. **A weight loss program that incorporates both dietary change and an exercise program is a guarantee of a reshaping of the body and a loss of weight.**

ANS: F PTS: 1

20. **Over the counter (OTC) medicines are dangerous because they are not regulated.**

ANS: F PTS: 1

21. **A scientific model is an explanation for observed behavior.**

ANS: T PTS: 1

22. **Molarity (M) is calculated as: $M = \frac{\text{mol}}{\text{liters}}$. M would be considered a derived unit.**

ANS: T PTS: 1

23. **A monoatomic molecule cannot be reduced to a simpler chemical.**

ANS: T PTS: 1

24. **The yard is considered a derived SI unit.**

ANS: F PTS: 1

25. **One can always rely on the health information found on the world wide web.**

ANS: F PTS: 1

26. **A patient with a body temperature of 300 K would be considered as suffering from hypothermia.**

ANS: T PTS: 1