

**Review atomic structure, matter, periodic table****Multiple Choice**

Identify the letter of the choice that best completes the statement or answers the question.

- \_\_\_\_\_ 1. Which of the following is NOT an example of matter?  
a. air  
b. heat  
c. smoke  
d. water vapor
- \_\_\_\_\_ 2. A golf ball has more mass than a tennis ball because it \_\_\_\_\_.  
a. takes up more space  
b. contains more matter  
c. contains different kinds of matter  
d. has a definite composition
- \_\_\_\_\_ 3. A vapor is which state of matter?  
a. solid  
b. liquid  
c. gas  
d. all of the above
- \_\_\_\_\_ 4. Which state of matter has a definite volume and takes the shape of its container?  
a. solid  
b. liquid  
c. gas  
d. both b and c
- \_\_\_\_\_ 5. Which of the following is a heterogeneous mixture?  
a. air  
b. salt water  
c. steel  
d. soil
- \_\_\_\_\_ 6. Which of the following is a heterogeneous mixture?  
a. vinegar in water  
b. milk  
c. oil and vinegar  
d. air
- \_\_\_\_\_ 7. Separating a solid from a liquid by evaporating the liquid is called \_\_\_\_\_.  
a. filtration  
b. condensation  
c. solution  
d. distillation
- \_\_\_\_\_ 8. Which of the following is used for chemical symbols today?  
a. drawings  
b. icons  
c. letters  
d. numbers
- \_\_\_\_\_ 9. The chemical symbol for iron is \_\_\_\_\_.  
a. fe  
b. FE  
c. Fe  
d. Ir
- \_\_\_\_\_ 10. Which of the following is NOT a physical change?  
a. grating cheese  
b. melting cheese  
c. fermenting of cheese  
d. mixing two cheeses in a bowl
- \_\_\_\_\_ 11. Who was the man who lived from 460B.C.–370B.C. and was among the first to suggest the idea of atoms?  
a. Atomos  
b. Dalton  
c. Democritus  
d. Thomson
- \_\_\_\_\_ 12. The smallest particle of an element that retains the properties of that element is a(n) \_\_\_\_\_.  
a. atom  
b. electron  
c. proton  
d. neutron
- \_\_\_\_\_ 13. Dalton's atomic theory included which idea?  
a. All atoms of all elements are the same size.  
b. Atoms of different elements always combine in one-to-one ratios.  
c. Atoms of the same element are always identical.  
d. Individual atoms can be seen with a microscope.

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- \_\_\_\_\_ 14. Which of the following is true about subatomic particles?
- Electrons are negatively charged and are the heaviest subatomic particle.
  - Protons are positively charged and the lightest subatomic particle.
  - Neutrons have no charge and are the lightest subatomic particle.
  - The mass of a neutron nearly equals the mass of a proton.
- \_\_\_\_\_ 15. The particles that are found in the nucleus of an atom are \_\_\_\_\_.
- neutrons and electrons
  - electrons only
  - protons and neutrons
  - protons and electrons
- \_\_\_\_\_ 16. The atomic number of an element is the total number of which particles in the nucleus?
- neutrons
  - protons
  - electrons
  - protons and electrons
- \_\_\_\_\_ 17. An element has an atomic number of 76. The number of protons and electrons in a neutral atom of the element are \_\_\_\_\_.
- 152 protons and 76 electrons
  - 76 protons and 0 electrons
  - 38 protons and 38 electrons
  - 76 protons and 76 electrons
- \_\_\_\_\_ 18. What does the number 84 in the name krypton-84 represent?
- the atomic number
  - the mass number
  - the sum of the protons and electrons
  - twice the number of protons
- \_\_\_\_\_ 19. Isotopes of the same element have different \_\_\_\_\_.
- positions on the periodic table
  - chemical behavior
  - atomic numbers
  - mass numbers
- \_\_\_\_\_ 20. In which of the following sets is the symbol of the element, the number of protons, and the number of electrons given correctly?
- In, 49 protons, 49 electrons
  - Zn, 30 protons, 60 electrons
  - Cs, 55 protons, 132.9 electrons
  - F, 19 protons, 19 electrons
- \_\_\_\_\_ 21. Using the periodic table, determine the number of neutrons in  $^{16}\text{O}$ .
- 4
  - 8
  - 16
  - 24
- \_\_\_\_\_ 22. How many protons, electrons, and neutrons does an atom with atomic number 50 and mass number 125 contain?
- 50 protons, 50 electrons, 75 neutrons
  - 75 electrons, 50 protons, 50 neutrons
  - 120 neutrons, 50 protons, 75 electrons
  - 70 neutrons, 75 protons, 50 electrons
- \_\_\_\_\_ 23. If E is the symbol for an element, which two of the following symbols represent isotopes of the same element?
1.  $^{20}_{10}\text{E}$                       2.  $^{20}_{11}\text{E}$                       3.  $^{21}_9\text{E}$                       4.  $^{21}_{10}\text{E}$
- 1 and 2
  - 3 and 4
  - 1 and 4
  - 2 and 3
- \_\_\_\_\_ 24. How is the number of neutrons in the nucleus of an atom calculated?
- Add the number of electrons and protons together.
  - Subtract the number of electrons from the number of protons.
  - Subtract the number of protons from the mass number.
  - Add the mass number to the number of electrons.

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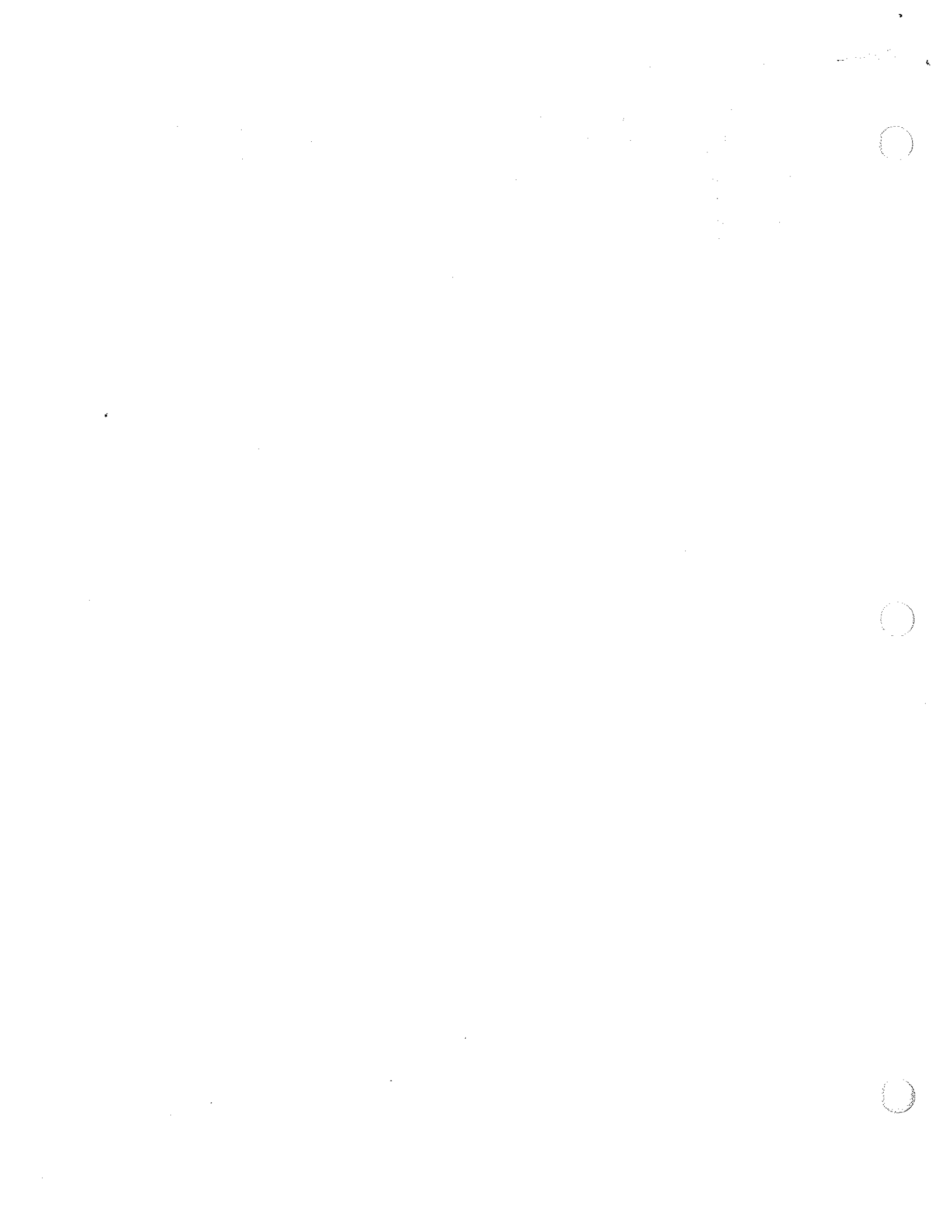
- \_\_\_\_\_ 25. In Bohr's model of the atom, where are the electrons and protons located?
- The electrons move around the protons, which are at the center of the atom.
  - The electrons and protons move throughout the atom.
  - The electrons occupy fixed positions around the protons, which are at the center of the atom.
  - The electrons and protons are located throughout the atom, but they are not free to move.
- \_\_\_\_\_ 26. How many energy sublevels are in the second principal energy level?
- 1
  - 2
  - 3
  - 4
- \_\_\_\_\_ 27. What is the maximum number of electrons in the second principal energy level?
- 2
  - 8
  - 18
  - 32
- \_\_\_\_\_ 28. The letter "p" in the symbol  $4p^3$  indicates the \_\_\_\_\_.
- spin of an electron
  - orbital shape
  - principle energy level
  - speed of an electron
- \_\_\_\_\_ 29. What is the electron configuration of potassium?
- $1s^2 2s^2 2p^2 3s^2 3p^2 4s^1$
  - $1s^2 2s^2 2p^{10} 3s^2 3p^3$
  - $1s^2 2s^2 3s^2 3p^6 3d^1$
  - $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1$
- \_\_\_\_\_ 30. Emission of light from an atom occurs when an electron \_\_\_\_\_.
- drops from a higher to a lower energy level
  - jumps from a lower to a higher energy level
  - moves within its atomic orbital
  - falls into the nucleus
- \_\_\_\_\_ 31. Which of the following elements is in the same period as phosphorus?
- carbon
  - magnesium
  - nitrogen
  - oxygen
- \_\_\_\_\_ 32. Each period in the periodic table corresponds to \_\_\_\_\_.
- an energy level
  - an energy sublevel
  - an electron
  - a valence electron
- \_\_\_\_\_ 33. The modern periodic table is arranged in order of increasing atomic \_\_\_\_\_.
- mass
  - charge
  - number
  - radius
- \_\_\_\_\_ 34. Who arranged the elements according to atomic mass and used the arrangement to predict the properties of missing elements?
- Henry Moseley
  - Antoine Lavoisier
  - John Dalton
  - Dmitri Mendeleev
- \_\_\_\_\_ 35. Of the elements Pt, V, Li, and Kr, which is a nonmetal?
- Pt
  - V
  - Li
  - Kr
- \_\_\_\_\_ 36. To what category of elements does an element belong if it is a poor conductor of electricity?
- transition elements
  - metalloids
  - nonmetals
  - metals
- \_\_\_\_\_ 37. What element has the electron configuration  $1s^2 2s^2 2p^6 3s^2 3p^2$ ?
- nitrogen
  - selenium
  - silicon
  - silver

- \_\_\_ 38. Which of the following is true about the electron configurations of the noble gases?
- The highest occupied *s* and *p* sublevels are completely filled.
  - The highest occupied *s* and *p* sublevels are partially filled.
  - The electrons with the highest energy are in a *d* sublevel.
  - The electrons with the highest energy are in an *f* sublevel.
- \_\_\_ 39. Which of the following elements is a transition metal?
- cesium
  - copper
  - tellurium
  - tin
- \_\_\_ 40. How does atomic radius change from top to bottom in a group in the periodic table?
- It tends to decrease.
  - It tends to increase.
  - It first increases, then decreases.
  - It first decreases, then increases.
- \_\_\_ 41. Atomic size generally \_\_\_\_.
- increases as you move from left to right across a period
  - decreases as you move from top to bottom within a group
  - remains constant within a period
  - decreases as you move from left to right across a period
- \_\_\_ 42. What element in the second period has the largest atomic radius?
- carbon
  - lithium
  - potassium
  - neon
- \_\_\_ 43. What is the charge of a cation?
- a positive charge
  - no charge
  - a negative charge
  - The charge depends on the size of the nucleus.
- \_\_\_ 44. What is the element with the lowest electronegativity value?
- cesium
  - helium
  - calcium
  - fluorine
- \_\_\_ 45. Which statement is true about electronegativity?
- Electronegativity is the ability of an anion to attract another anion.
  - Electronegativity generally increases as you move from top to bottom within a group.
  - Electronegativity generally is higher for metals than for nonmetals.
  - Electronegativity generally increases from left to right across a period.
- \_\_\_ 46. Compared with the electronegativities of the elements on the left side of a period, the electronegativities of the elements on the right side of the same period tend to be \_\_\_\_.
- lower
  - higher
  - the same
  - unpredictable
- \_\_\_ 47. Which of the following statements correctly compares the relative size of an ion to its neutral atom?
- The radius of an anion is greater than the radius of its neutral atom.
  - The radius of an anion is identical to the radius of its neutral atom.
  - The radius of a cation is greater than the radius of its neutral atom.
  - The radius of a cation is identical to the radius of its neutral atom.
- \_\_\_ 48. As you move from left to right across the second period of the periodic table \_\_\_\_.
- ionization energy increases
  - atomic radii increase
  - electronegativity decreases
  - atomic mass decreases

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- \_\_\_\_\_ 49. A solid with a mass of 19.3 g is added to a graduated cylinder filled with water to the 25.0 mL mark. After the solid sinks to the bottom, the water level is at 35.8 mL. What is the density of the solid?
- a. 0.539 g/mL
  - b. 0.560 g/mL
  - c. 1.79 g/mL
  - d. 2.19 g/mL
  - e. 8.50 g/mL



**Review atomic structure, matter, periodic table  
Answer Section**

**MULTIPLE CHOICE**

1. B
2. B
3. C
4. B
5. D
6. C
7. D
8. C
9. C
10. C
11. C
12. A
13. C
14. D
15. C
16. B
17. D
18. B
19. D
20. A
21. B
22. A
23. C
24. C
25. A
26. B
27. B
28. B
29. D
30. A
31. B
32. A
33. C
34. D
35. D
36. C
37. C
38. A
39. B

- 40. B
- 41. D
- 42. B
- 43. A
- 44. A
- 45. D
- 46. B
- 47. A
- 48. A
- 49. C