

Name _____

Section _____

CHEMISTRY UNIT TEST-MULTIPLE CHOICE

Choose the best answer to each of the following questions, and write them on your answer document. DO NOT WRITE ON THIS TEST!

1. Atoms have no electric charge because they:
 - a. Have an equal number of charged and uncharged particles
 - b. Have neutrons in their nuclei
 - c. Have an equal number of protons and electrons
 - d. Have an equal number of neutrons and protons.
2. A subatomic particle that has a negative charge is called a(n):
 - a. Molecule
 - b. Electron
 - c. Element
 - d. Compound
3. Which of the following statements is NOT true?
 - a. Protons have a positive charge.
 - b. A nucleus has a positive charge.
 - c. Neutrons have no charge.
 - d. Neutrons have a negative charge.
4. What is an atom's nucleus made of?
 - a. Protons and neutrons
 - b. Only protons
 - c. Only neutrons
 - d. Only electrons
5. The charge of an atom is:
 - a. Positive
 - b. Negative
 - c. Neutral
 - d. Unbalanced
6. An iron atom has a mass of 56. Its atomic number is 26. How many neutrons does it have?
 - a. 30
 - b. 56
 - c. 82
 - d. 26
7. An element's atomic number is equal to its number of:
 - a. Protons
 - b. Neutrons
 - c. Valence Electrons
 - d. Protons and Neutrons

Name _____

Section _____

8. Two different isotopes of an element have different:
 - a. Numbers of neutrons
 - b. Numbers of protons
 - c. Atomic numbers
 - d. Numbers of electrons
9. What is the mass number of an element that has 19 protons, 19 electrons, and 20 neutrons?
 - a. 19
 - b. 20
 - c. 39
 - d. 58
10. Which statement about the atom's nucleus is correct?
 - a. The nucleus is made of protons and neutrons and has a negative charge.
 - b. The nucleus is made of protons and neutrons and has a positive charge.
 - c. The nucleus is made of electrons and has a positive charge.
 - d. The nucleus is made of electrons and has a negative charge.
11. Oxygen's atomic number is 8. This means that the oxygen atom has
 - a. Eight neutrons in its nucleus.
 - b. A total of 8 protons and neutrons.
 - c. Eight protons in its nucleus
 - d. A total of eight neutrons and electrons.
12. An atom's mass number equals the number of:
 - a. Protons plus the number of electrons.
 - b. Protons plus the number of neutrons.
 - c. Protons
 - d. Neutrons
13. A Ca^{2+} ion differs from a Ca atom in that the Ca^{2+} ion has
 - a. More Electrons (gained electrons)
 - b. More Protons
 - c. Fewer Protons
 - d. Fewer Electrons (Lost Electrons)
14. How many electrons does an element with a mass number of 36 have?
 - a. 36
 - b. 18
 - c. 72
 - d. Cannot be determined.

Name _____

Section _____

15. The nucleus of an atom consists of 8 protons and 6 neutrons. The total number of electrons present in a neutral atom of this element is:
- 6
 - 8
 - 2
 - 14
16. Atoms of Oxygen-16, Oxygen-17, and Oxygen-18 have the same number of:
- Protons, but a different number of electrons.
 - Electrons, but a different number of protons.
 - Protons, but a different number of neutrons.
 - Neutrons, but a different number of protons.
17. All atoms of an element have the same:
- Number of neutrons
 - Atomic Mass
 - Atomic Number
 - Mass Number
18. The atomic number is always equal to the number of:
- Neutrons in the nucleus
 - Protons in the nucleus
 - Neutrons plus protons in the atom.
 - Protons plus electrons in the atom.
19. How many protons are there in the nucleus of an atom of beryllium?
- 2
 - 4
 - 9
 - 5
20. Which subatomic particle is negative?
- Proton
 - Neutron
 - Electron
 - Nucleus
21. Which of the following particles has the least mass?
- Neutron
 - Proton
 - Electron
 - Hydrogen Nucleus
22. What is the total number of electrons in an Mg^{2+} ion?
- 10
 - 24
 - 2
 - 38

Name_____

Section_____

23. Compared to the entire atom, the nucleus of the atom is:
- Smaller and contains most of the atom's mass.
 - Smaller and contains little of the atom's mass.
 - Larger and contains most of the atom's mass.
 - Larger and contains little of the atom's mass.
24. Which symbols represent atoms that are isotopes?
- C-14 and N-14
 - I-131 and I-131
 - O-16 and O-18
 - Rn-222 and Ra-222
25. Which of the following occurs in an ionic bond?
- Oppositely charged ions attract.
 - Two atoms share two electrons.
 - Two atoms share two or more electrons.
 - Like-charged ions attract.
26. Which of the following pairs of elements is most likely to form an ionic bond?
- Magnesium and Fluoride
 - Nitrogen and Sulfur
 - Oxygen and Chlorine
 - Sodium and Aluminum
27. How do atoms achieve noble-gas configuration in single covalent bonds?
- One atom completely loses two electrons to the other atom in the bond.
 - Two atoms share two pairs of electrons.
 - Two atoms share two electrons.
 - Two atoms share one electrons.
28. Why do atoms share electrons in covalent bonds?
- To become ions and attract each other.
 - To attain a noble-gas configuration.
 - To become more polar.
 - To increase their atomic numbers.
29. Which of the following can form diatomic molecules held together by triple bonds?
- Carbon
 - Oxygen
 - Fluorine
 - Nitrogen

Name _____

Section _____

30. Which of the following is the name given to the pairs of valence electrons that do not participate in bonding in a diatomic oxygen molecule?
- Unvalenced Pair
 - Outer Pair
 - Inner Pair
 - Lone Pair
31. The outermost shell of electrons involved in bonding is called the
- Valence shell
 - Electron Cloud
 - Inner shell
 - Nucleus
32. How does calcium obey the octet rule when reacting to form compounds?
- It gains electrons.
 - It gives up electrons.
 - It does not change the number of electrons.
 - Calcium does not obey the octet rule.
33. Which of the following molecules is bent?
- N_2
 - H_2O
 - NH_3
 - CCl_4
34. When two atoms of fluorine bond, how many electrons will be shared between them?
- 1
 - 2
 - 3
 - 4
35. A catalyst is
- A chemical that speeds up the reaction/
 - The product of a reaction.
 - Is a reactant.
 - A solid product of the reaction.
36. In every balanced chemical equation, each side of the equation has the same number of _____.
- Atoms
 - Molecules
 - Coefficients
 - Moles.

Name _____

Section _____

37. A chemical change is different than a physical change because in a chemical change
- chemicals are used
 - molecules do not physically touch
 - A new substance is formed and in a physical change no new substance is formed.
 - The change can be seen but in a physical change, it cannot.
38. If more reactants are used in a chemical reaction, more products will be produced. This is because:
- More reactants cause the reaction to heat up.
 - More reactants take up the same volume.
 - More reactants have more atoms to react to form more products.
 - Too many products can slow down the reaction.
39. If two substances react and the temperature of the mixture increases, the reaction is:
- Endothermic
 - Exothermic
 - Not going to happen unless it is heated.
 - One that causes atoms to be destroyed.
40. The atoms/molecules put into a chemical reaction are called
- Reactants
 - Products
 - Elements
 - Mixtures
41. The atoms/molecules produced by a chemical reaction are called
- Reactants
 - Products
 - Elements
 - Mixtures
42. The following chemical equation is an example of what type of reaction?
 $2\text{H}_2\text{O}_2 \rightarrow 2\text{H}_2\text{O} + \text{O}_2$
- Single-Replacement
 - Double-Replacement
 - Dissociation
 - Combustion
43. In the reaction shown, what type of bond is broken? $2\text{H}_2\text{O}_2 \rightarrow 2\text{H}_2\text{O} + \text{O}_2$
- Ionic
 - Covalent
 - Diatomic
 - None of the above

Name _____

Section _____

44. When salt is dissolved in water, this is considered a
- Mixture
 - Compound
 - Atom
 - Element
45. In any sample of water, there are always some water molecules which have become ions. Transferring a _____ from one water molecule to another produces these ions.
- Neutron
 - Electron
 - Proton
 - Molecule
46. If the reactants on the left side of an equation are $C_3H_8 + 5O_2$, the products in a balanced equation could be:
- $4CO_2 + 3H_2O$
 - $3CO_2 + 4H_2O$
 - $2CO_2 + 3H_2O$
 - $3CO + 4H_2O$
47. It takes _____ to break bonds, and _____ is released when bonds are formed.
- Energy
 - Mass
 - Matter
 - Atoms
48. Which of the following is the sign that a chemical change has occurred?
- A precipitate (solid) forms when mixing two chemicals.
 - A change from a liquid to a solid.
 - Dividing the substance into two containers.
 - Evaporating the substance using heat.
49. What are the missing coefficients for the reaction shown below?
- $$\underline{\hspace{1cm}} CO_2 + \underline{\hspace{1cm}} H_2O \rightarrow \underline{\hspace{1cm}} C_6H_{12}O_6 + \underline{\hspace{1cm}} O_2$$
- 5,5,1,5
 - 6,6,1,6
 - 2,4,1,5
 - 1,1,1,1
50. Verify that your name and section are on your answer document. Then, put a check on the line.

Name _____

Section _____

CHEMISTRY UNIT TEST MULTIPLE CHOICE ANSWER DOCUMENT

- | | | |
|-----------|-----------|-----------|
| 1. _____ | 20. _____ | 39. _____ |
| 2. _____ | 21. _____ | 40. _____ |
| 3. _____ | 22. _____ | 41. _____ |
| 4. _____ | 23. _____ | 42. _____ |
| 5. _____ | 24. _____ | 43. _____ |
| 6. _____ | 25. _____ | 44. _____ |
| 7. _____ | 26. _____ | 45. _____ |
| 8. _____ | 27. _____ | 46. _____ |
| 9. _____ | 28. _____ | 47. _____ |
| 10. _____ | 29. _____ | 48. _____ |
| 11. _____ | 30. _____ | 49. _____ |
| 12. _____ | 31. _____ | 50. _____ |
| 13. _____ | 32. _____ | |
| 14. _____ | 33. _____ | |
| 15. _____ | 34. _____ | |
| 16. _____ | 35. _____ | |
| 17. _____ | 36. _____ | |
| 18. _____ | 37. _____ | |
| 19. _____ | 38. _____ | |

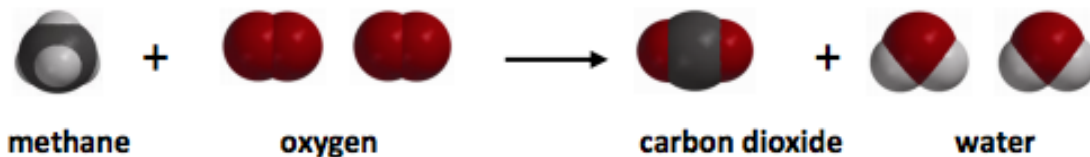
Name _____

Section _____

CHEMISTRY UNIT TEST-FREE RESPONSE

Answer the questions below.

1. What is the difference between a chemical change and a physical change?
2. In a chemical reaction, is it possible to change the amount of products by changing the amount of reactants? Why?
3. In the chemical reaction between methane (CH_4) and oxygen gas (O_2), the products carbon dioxide (CO_2) and water (H_2O) are formed. Explain what happens during a chemical reaction that causes the atoms in the reactants to end up in the products.



How do you know that this equation is balanced?

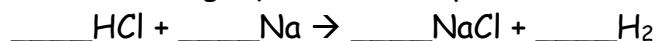
4. Explain, in terms of making and breaking bonds, what it means for a reaction to be exothermic.

Name _____

Section _____

5. What does it mean to say that "atoms are not created or destroyed" in a chemical reaction?

6. Balance the following equation. Verify that the atoms match.



7. Identify the Protons, Neutrons, Electrons, and draw the Bohr Model, Lewis Structure for the elements below.

Silicon

Bohr Model:

Lewis Diagram:

P: _____

E: _____

N: _____

Fluorine

P: _____

E: _____

N: _____

8. What type of bond forms between Beryllium and Chlorine? Explain.

Draw the diagram showing the bond. Write the chemical formula.

Name_____

Section_____

9. What type of bond forms between Phosphorus and Chlorine? Explain.

Draw the diagram showing the bond. Write the chemical formula.

10. In the periodic table, what happens to the number of valence electrons as you move from left to right across a row in the table?

In the periodic table, what do you notice about the number of valence electrons as you move down a column?