Basic Chemistry Concepts

Multiple Choice Questions (MCQs)

1. **Which of the following is NOT a postulate of Dalton's Atomic Theory?**
   a) Atoms are indivisible and indestructible.
   b) Atoms of the same element are identical in mass and properties.
   c) Atoms can be created or destroyed in a chemical reaction.
   d) Compounds are formed by the combination of two or more different kinds of atoms.

2. **One of the limitations of Dalton's Atomic Theory is that it did not account for the existence of:**
   a) Isotopes
   b) Elements
   c) Compounds
   d) Mixtures

3. **According to Dalton's Atomic Theory, atoms of different elements differ in:**
   a) Size, mass, and chemical properties
   b) Size and mass only
   c) Chemical properties only
   d) Mass only

4. **What is an atom?**
   a) The smallest unit of a compound that retains its properties.
   b) The smallest unit of an element that retains its properties.
   c) A substance composed of two or more elements.
   d) A particle with no mass.

5. **Which of the following is part of the structure of an atom?**
   a) Nucleus and electron cloud
   b) Protons and neutrons only
   c) Electrons and ions
   d) Molecules and compounds

6. **In which atomic model are electrons embedded in a positive sphere?**
   a) Dalton's Model
   b) Thomson's Model
   c) Rutherford's Model
   d) Bohr's Model

7. **Which atomic model introduced the concept of fixed energy levels for electrons?**
   a) Dalton's Model
   b) Thomson's Model

c) Rutherford's Model
d) Bohr's Model

8. **What is a molecule?**
   a) The smallest unit of a compound that retains its chemical properties.
   b) The smallest unit of an element that retains its chemical properties.
   c) A combination of two or more compounds.
   d) A substance composed of one type of atom.

9. **Which of the following is a diatomic molecule?**
   a) H_2O
   b) CO_2
   c) O_2
   d) P_4

10. **Which of the following best describes an element?**
    a) A substance that can be broken down into simpler substances by chemical means.
    b) A substance that cannot be broken down into simpler substances by chemical means.
    c) A combination of two or more compounds.
    d) A homogeneous mixture.

11. **Which of the following is a metal?**
    a) Oxygen
    b) Carbon
    c) Silicon
    d) Iron

12. **Which of the following is NOT a characteristic of a compound?**
    a) Fixed composition
    b) Retains the properties of its constituent elements
    c) Chemically combined elements
    d) Can be broken down into simpler substances by chemical means

13. **Which type of compound is formed by the transfer of electrons from one atom to another?**
    a) Ionic
    b) Covalent
    c) Metallic
    d) None of the above

14. **How do mixtures differ from compounds?**
    a) Mixtures have a fixed composition, compounds do not.
    b) Compounds retain the properties of their individual substances, mixtures do not.
    c) Mixtures can be separated by physical methods, compounds cannot.
    d) Mixtures are always homogeneous, compounds are not.

15. **Which atomic model first introduced the idea of a dense nucleus surrounded by electrons?**
    a) Dalton's Model
    b) Thomson's Model

c) Rutherford's Model
d) Bohr's Model

Answer Key

1. c) Atoms can be created or destroyed in a chemical reaction.
2. a) Isotopes
3. a) Size, mass, and chemical properties
4. b) The smallest unit of an element that retains its properties.
5. a) Nucleus and electron cloud
6. b) Thomson's Model
7. d) Bohr's Model
8. a) The smallest unit of a compound that retains its chemical properties.
9. c) O_2
10. b) A substance that cannot be broken down into simpler substances by chemical means.
11. d) Iron
12. b) Retains the properties of its constituent elements
13. a) Ionic
14. c) Mixtures can be separated by physical methods, compounds cannot.
15. c) Rutherford's Model