📄 GUESS PAPER

Chemistry – Class 9

Sindh Board Examination

📝 SECTION A: MCQs (Very Important)

1. Chemistry is the study of _____.
2. Atomic number is equal to number of _____.
3. Avogadro's number is _____.
4. The charge on proton is _____.
5. Elements of group 18 are called _____.
6. The bond formed by transfer of electrons is _____.
7. Octet rule is related to _____ electrons.
8. Diffusion is fastest in _____.
9. The smallest particle of an element is _____.
10. Covalent bond is formed by _____ electrons.
11. Who presented modern periodic law?
12. Atomic radius decreases across a _____.
13. Neutron was discovered by _____.
14. The outermost shell is called _____ shell.

Ionic compounds have _____ melting point.

- Chemistry is the study of **matter and its changes**.
- Atomic number is equal to number of **protons**.
- Avogadro's number is **6.02×10^{23}**.
- The charge on proton is **positive**.
- Elements of group 18 are called **noble gases**.
- The bond formed by transfer of electrons is **ionic bond**.
- Octet rule is related to **eight** electrons.
- Diffusion is fastest in **gases**.
- The smallest particle of an element is **atom**.
- Covalent bond is formed by **sharing** electrons.

- Modern periodic law was presented by **Henry Moseley**.
- Atomic radius decreases across a **period**.
- Neutron was discovered by **James Chadwick**.
- The outermost shell is called **valence** shell.
- Ionic compounds have **high** melting point.

□ SECTION B: Short Questions (Highly Expected)

Prepare ALL, usually 8–10 come from these:

1. Define chemistry.
2. What is atom?
3. Define atomic number.
4. What are isotopes?
5. Define molecule.
6. What is periodic table?
7. Define ionic bond.
8. What is covalent bond?
9. What is octet rule?
10. Define diffusion.
11. What are noble gases?
12. What is valence shell?
13. Define electronegativity.
14. What is boiling point?

1. What is chemical bond?
   Chemistry:
   Chemistry is the branch of science that deals with the study of **matter, its composition, structure, properties, and the changes it undergoes**.
2. **Atom:**
   An atom is the **smallest particle of an element** that can take part in a chemical reaction.
3. **Atomic Number:**
   The atomic number is the **number of protons** present in the nucleus of an atom.
4. **Isotopes:**
   Isotopes are **atoms of the same element** having the **same atomic number but different mass numbers**.
5. **Molecule:**
   A molecule is the **smallest particle of a substance** that can exist independently and retains the **chemical properties** of that substance.
6. **Periodic Table:**
   The periodic table is a **systematic arrangement of elements** in order of **increasing atomic number**.

7. **Ionic Bond:**
   An ionic bond is formed by the **transfer of electrons** from one atom to another.
8. **Covalent Bond:**
   A covalent bond is formed by the **sharing of electrons** between atoms.
9. **Octet Rule:**
   The octet rule states that atoms tend to **gain, lose, or share electrons** to complete **eight electrons** in their outermost shell.
10. **Diffusion:**
    Diffusion is the **movement of particles** from a region of **higher concentration to lower concentration**.
11. **Noble Gases:**
    Noble gases are elements of **Group 18** of the periodic table and are **chemically inert**.
12. **Valence Shell:**
    The valence shell is the **outermost shell** of an atom that contains **valence electrons**.
13. **Electronegativity:**
    Electronegativity is the **ability of an atom to attract electrons** towards itself in a chemical bond.
14. **Boiling Point:**
    The boiling point is the **temperature at which a liquid changes into a gas**.
15. **Chemical Bond:**
    A chemical bond is the **force of attraction** that holds atoms or ions together in a compound.

If you want, I can:

● SECTION C: Long Questions (Most Important)

☞ **Prepare these carefully – very high chance**

1. Explain **Dalton's atomic theory** (any 4 points).
2. Describe **Rutherford's atomic model** with drawbacks.
3. Explain **modern periodic law** and periodic table.
4. Describe **ionic bond** with example.
5. Explain **covalent bond** with example.
6. Write **differences between element, compound, and mixture**.

Explain structure of atom (proton, neutron, electron).

. Dalton's Atomic Theory (Any Four Points)

John Dalton proposed his atomic theory in 1808. Its main points are:

1. All matter is made up of very small particles called **atoms**.
2. Atoms of the same element are **identical in mass and properties**.
3. Atoms of different elements have **different masses and properties**.
4. Atoms cannot be **created, destroyed, or divided** during chemical reactions.
5. Chemical reactions involve the **rearrangement of atoms**.

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2. Rutherford's Atomic Model with Drawbacks

Rutherford's Atomic Model:

1. An atom consists of a **small, dense, positively charged nucleus** at the center.
2. Most of the mass of the atom is concentrated in the **nucleus**.
3. **Electrons revolve** around the nucleus in circular paths.
4. Most of the atom is **empty space**.

Drawbacks:

1. According to classical physics, revolving electrons should **lose energy** and fall into the nucleus.
2. The model could not explain the **stability of the atom**.
3. It failed to explain the **line spectra of elements**.

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3. Modern Periodic Law and Periodic Table

Modern Periodic Law:

The modern periodic law states that **the physical and chemical properties of elements are periodic functions of their atomic numbers**.

Periodic Table:

1. Elements are arranged in order of **increasing atomic number**.
2. Horizontal rows are called **periods**.
3. Vertical columns are called **groups**.
4. Elements in the same group have **similar properties**.
5. The modern periodic table has **7 periods and 18 groups**.

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4. Ionic Bond (with Example)

An **ionic bond** is formed by the **complete transfer of electrons** from one atom to another.

Example: Sodium Chloride (NaCl)

- Sodium loses one electron to form Na^+ ion.
- Chlorine gains one electron to form Cl^- ion.
- The electrostatic attraction between Na^+ and Cl^- forms an **ionic bond**.

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5. Covalent Bond (with Example)

A **covalent bond** is formed by the **sharing of electrons** between atoms.

Example: Hydrogen Molecule (H_2)

- Each hydrogen atom shares one electron.
- A pair of shared electrons forms a **covalent bond**.
- Both atoms achieve a stable electronic configuration.

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6. Differences between Element, Compound, and Mixture

Property	Element	Compound	Mixture
Definition	One kind of atom	Two or more elements chemically combined	Two or more substances physically mixed
Composition	Fixed	Fixed	Variable
Separation	Cannot be separated	Separated by chemical methods	Separated by physical methods
Properties	Same throughout	Different from elements	Retains properties of components

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7. Structure of Atom (Proton, Neutron, Electron)

An atom consists of three main particles:

Proton:

- Positively charged particle
- Present in the **nucleus**
- Has mass of **1 amu**

Neutron:

- Neutral particle
- Present in the **nucleus**
- Has mass of **1 amu**

Electron:

- Negatively charged particle
- Revolves around the nucleus in **shells**
- Has negligible mass

□ SECTION D: Numericals (Must Prepare)

1. Calculate number of moles in **44 g of CO_2**.
2. Find molecular mass of **H_2SO_4**.
3. Calculate mass of **2 moles of NaCl**.

Find moles in 18 g of H_2O.

1. Calculate number of moles in 44 g of CO_2

Given:
Mass of CO_2 = 44 g
Molecular mass of CO_2 = 12 + (2 × 16) = **44 g/mol**

Formula:

Number of moles=Given massMolar mass\text{Number of moles} = \frac{\text{Given mass}}{\text{Molar mass}}Number of moles=Molar massGiven mass

Calculation:

Moles=4444=1\text{Moles} = \frac{44}{44} = 1Moles=4444=1

Answer:
☞ **Number of moles = 1 mole**

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2. Find molecular mass of H_2SO_4

Atomic masses:
H = 1, S = 32, O = 16

Calculation:

(2×1)+(1×32)+(4×16)=2+32+64=98(2 × 1) + (1 × 32) + (4 × 16) = 2 + 32 + 64 = 98(2×1)+(1×32)+(4×16)=2+32+64=98

Answer:
☞ **Molecular mass of H_2SO_4 = 98 g/mol**

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3. Calculate mass of 2 moles of NaCl

Given:
Moles = 2
Molecular mass of NaCl = 23 + 35.5 = **58.5 g/mol**

Formula:

Mass=Moles×Molar mass\text{Mass} = \text{Moles} × \text{Molar mass}Mass=Moles×Molar mass

Calculation:

Mass=2×58.5=117\text{Mass} = 2 × 58.5 = 117Mass=2×58.5=117

Answer:
☞ **Mass = 117 g**

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4. Find moles in 18 g of H_2O

Given:
Mass of H_2O = 18 g
Molecular mass of H_2O = (2 × 1) + 16 = **18 g/mol**

Formula:

Moles=MassMolar mass\text{Moles} = \frac{\text{Mass}}{\text{Molar mass}}Moles=Molar massMass

Calculation:

Moles=1818=1\text{Moles} = \frac{18}{18} = 1Moles=1818=1

Answer:
☞ **Number of moles = 1 mole**

SECTION E: Reasoning / Why & How Questions

1. Why noble gases are chemically inert?
2. Why gases are highly compressible?
3. Why ionic compounds have high melting points?
4. Why covalent compounds do not conduct electricity?

Why diffusion is faster in gases than solids?

2. Why gases are highly compressible?

Gases are highly compressible because there is **large empty space between gas particles**, so they can be easily compressed.

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3. Why ionic compounds have high melting points?

Ionic compounds have high melting points because **strong electrostatic forces of attraction** exist between positively and negatively charged ions, which require a lot of energy to break.

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4. Why covalent compounds do not conduct electricity?

Covalent compounds do not conduct electricity because they **do not produce free ions or charged particles**.

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