# DELHI PUBLIC SCHOOL BANGALORE -EAST

## CHEMISTRY

## ATOMS AND MOLECULES

**NAME:_____CLASS:IX SEC:_____ DATE: _____**

**DIRECTION :** In the following questions, a statement of assertion (A) is followed by a statement ofreason (R). Mark the correct choice as:

(a)Both assertion(A) and reason(R) are true and reason(R) is the correct explanation of assertion(A).

(b)Both assertion(A) and reason(R) are true but reason(R) is not the correct explanation of assertion(A).(c)Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason( R) is true.

1. **Assertion :** On burning magnesium with Oxygen, the mass of magnesium oxide formed is equal tothe total mass of Magnesium and Oxygen.

   **Reason:** In a chemical substance, the elements are always present in a definite proportion.

2. **Assertion :** Atomic mass of aluminium is 27.

   **Reason :** An atom of aluminium is 27 times heavier than 1/12th of the mass of carbon-12 atom.

3. **Assertion :** Atomicity of oxygen is 2.

   **Reason :** 1 mole of an element contains $6.023 \times 10^{23}$ atoms.

4. **Assertion :** The molecular mass and formula unit mass of a substance is the sum of atomic masses of all the atoms in the molecular formula or formula unit of a compound.

   **Reason :** The only difference between the molecular mass and formula unit mass is that, former is for molecular compounds (covalent compounds) and latter is for ionic compounds. However, their numerical value is the same.

**Choose the correct option:**

5. The number of atoms present in a molecule of a substance is called
   (a)molecularity (b) atomicity (c) valency (d)reactivity

6. When an atom loses electrons, it is called a / (an) _____and has a_____charge.
   (a) Anion, positive (b) Cation, positive (c) Anion, negative (d) Cation, negative

7. The atomic mass of calcium (Ca) is 40 u. The number of moles in 60 g of calcium is (a) 0.5 mol (b) 2.0 mol (c) 1.5 mol (d) 0.75 mol

8. Which of the following represents a polyatomic ion?
   (a) Sulphide (b) Chloride (c) Sulphate (d) Nitride

**9.** If 32 g of sulphur has x atoms, then the number of atoms in 32 g of oxygen will be____

**10.** Write the molecular formulae of the following compounds:
a)Copper (II) bromide (b) Aluminum (III) nitrate (c) Calcium(II) phosphate

**11.** 11.Give the chemical formulae for the following compound and compute the ratio by mass of the combining elements in each one of them.
(a) Ammonia (b) Carbon monoxide (c) Magnesium sulphide (d) Aluminium fluoride

**12.** Calculate the number of atoms and molecules in 124 grams of phosphorous, $P_4$ (Given atomicmass of P = 31.0 u, $N_A$= 6.022 X $10^{23}$ $mol^{-1}$ )

**13.** State which of the following:
a) Has higher number of moles: 5g of $N_2O$ or 5g of NO
b) Has higher mass: 1mole of $CO_2$ or 1 mole of CO

**14.** Calculate the:
a. Number of molecules in 90 g of $H_2O$
b. Number moles in 19 g of $H_2O_2$

**15.** Distinguish between molecular mass and molar mass

**16.** a. Calculate the number of molecules in a. 50 g of $CaCO_3$.
b. Calculate the mass of 0.5 moles of nitrogen gas.
c. Calculate the number of moles in 50 g of NaCl

**17**.Verify by calculating that
a. 5 moles of $CO_2$ and 5 moles of $H_2O$ do not have the same mass.
b.240 gm of calcium and 240 gm of magnesium have a mole ratio of 3:5

**18.** Explain why the number of atoms in one mole of hydrogen gas is double the number ofatoms in one mole of Helium gas?

**19.** A flask P contains 0.5 mole of oxygen gas. Another flask Q contains 0.4 mole of ozone gas.Which of the two flasks contain greater number of oxygen atoms?

**20.** Write the cations and anions present, if any, in the following:
a. $CH_3COONa$ b. NaCl c. $H_2$ d. $NH_4NO_3$

**21.** A compound XH is formed by the combination of an element X with hydrogen. Find the valency of the elements. Write the formula of the following compounds
a. X with nitrogen b. X with oxygen.

**22**.(a) Give an example in each of the following cases:
(i) a divalent anion.
(ii) a trivalent cation.
(iii) a monovalent anion.

23. Give the formulae of the compounds formed from the following sets of elements:
a. Calcium and fluorine
b. Hydrogen and sulphur
c. Carbon and chlorine

24. Calculate the
a. Mass of 1.0505 X $10^{23}$ molecules of carbon dioxide.
b. Number of molecules in 0.25 moles of $NH_3$
c. Formula unit mass of $Na_2SO_4$.

25. Compute the ions present in 5.85 g of sodium chloride.

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