CBSE Test Paper 03

Chapter 03 Atoms and Molecules

1. Neutron: **(1)**

   a. Has charge but no mass.
   b. Has neither charge nor mass.
   c. Has charge as well as mass.
   d. has mass but no charge.

2. Which is not true about H_2SO_4? **(1)**

   (i) It is composed of 2 Hydrogen, 1 Sulphur and 4 Oxygen atoms.
   (ii) It relative molecular mass is 98.
   (iii) It is composed of one molecule of H_2, one atom of S and two molecules of O_2
   (iv) Its relative molecular mass is 108.

   a. All of these
   b. (iii) and (iv) are correct
   c. (ii) and (iii) are correct
   d. (i), (ii) and (iii) are correct

3. Argentum is the Latin name of: **(1)**

   a. Tungsten
   b. Silver
   c. Sodium
   d. Antimony

4. Match the following with correct response: **(1)**

(1) Cobalt	(A) Na
(2) Copper	(B) Cu
(3) Sulphur	(C) Co

(4) Sodium	(D) S

a. 1-B, 2-D, 3-A, 4-C
b. 1-D, 2-A, 3-C, 4-B
c. 1-A, 2-C, 3-B, 4-D
d. 1-C, 2-B, 3-D, 4-A

5. What is the latin name of sodium? **(1)**

a. Natrium
b. None of these
c. Kalium
d. Plumbum

6. β -particles are represented as :- **(1)**

a. ${}^{1}_{-1}e$
b. ${}^{1}_{0}e$
c. ${}^{0}_{-1}e$
d. ${}^{0}_{+1}e$

7. What is an ion? Give one example. **(1)**

8. Write the atomicity of the following molecules: **(1)**

a. H_2SO_4
b. CCI_4

9. What is the atomicity of ammonia? **(1)**

10. Define atomicity. **(1)**

11. What is basic difference between atoms and molecules? **(3)**

12. Calculate the number of moles in 3.011×10^{23} molecules of nitrogen. **(3)**

13. How many moles are present in 4 g of sodium hydroxide? **(3)**

14. Find the ratio of mass of the combining elements in the following compounds: **(5)**

    a. $CaCO_3$
    b. $MgCl_2$
    c. H_2SO_4
    d. C_2H_5OH
    e. NH_3
    f. $Ca(OH)_2$

15. Give the names of the elements present in the following compounds. **(5)**

    i. Quick lime
    ii. Hydrogen bromide
    iii. Baking powder
    iv. Potassium sulphate

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Answers

1. d. has mass but no charge.
   Explanation: A neutron has mass but it has no charge.

2. b. (iii) and (iv) are correct.
   Explanation: H_2SO_4 is composed of 2 Hydrogen, 1 Sulphur and 4 Oxygen atoms. It relative molecular mass is 98.

3. b. Silver
   Explanation: The Latin name of Silver is Argentum. The symbol of Silver is Ag.

4. d. 1-C, 2-B, 3-D, 4-A
   Explanation:

(1) Cobalt	(C) Co
(2) Copper	(B) Cu
(3) Sulphur	(D) S
(4) Sodium	(A) Na

   Symbol of Copper is derived from Latin **Cu**prum. Symbol of Sodium is derived from Latin Natrium.

5. a. Natrium
   Explanation: Latin name of sodium is Natrium. Therefore, the symbol of Sodium is Na.

6. c. $^{0}_{-1}e$
   Explanation: $^{0}_{-1}e$ is the correct representation of a beta particle. A beta particle is denoted by the lower-case Greek letter beta (Symbol β). It is a high energy, high speed electron or positron emitted in the radioactive decay of a nucleus. It is sometimes called a beta ray. An electron has negligible mass - hence the superscript 0. An electron has a negative charge - hence a subscript

-1.

7. An ion is a positively or negatively charged atom (or group of atoms). For example:,. $PO_4^{3-}, H^+ Pb^+$
8. Atomicity is the number of atoms present in one molecule of a substance.
   a. In H_2SO_4, 2 hydrogen atom, 1 sulphur atom & 4 oxygen atoms are present. Hence the atomicity of H_2SO_4 is 7.
   b. In CCI_4, 1 carbon atom & 4 chlorine atoms are present. Hence the atomicity of CCI_4 is 5.
9. Atomicity of ammonia (NH_3) is 4 because one molecule of NH_3 has 1 nitrogen atom and 3 hydrogen atoms.
10. Atomicity is the number of atoms present in one molecule of a substance.
11. Atoms except those of noble or inert gas elements cannot exist of their own. However all molecules can have independent existence.
    Atom consist of only one type of matter while molecules are a combination of two or more atoms.
12. 1 mole of nitrogen contains 6.022×10^{23} molecules
    therefore, 6.022×10^{23} molecules of nitrogen=1 mol
    1 molecule of nitrogen
    Therefore, 3.011×10^{23} molecules of nitrogen
13. 1 mole of atoms = Gram atomic mass
    1 mole of sodium hydroxide = Gram atomic mass
    Gram molar mass of NaOH =23+16+1 =40 g
    40 g of NaOH = 1 mol
    1 g of NaOH =1/40 mol
    4 g of NaOH =1/40 $\times$4 mol
    = 0.1 mole
14. a. $CaCO_3$

        Ca : C : O $\times$ 3
        40 : 12 : 16 $\times$ 3
        40 : 12 : 48
        10 : 3 : 12

    b. $MgCl_2$

Mg : Cl × 2

24 : 35.5 × 2

24 : 71

c. H_2SO_4

H × 2 : S : O × 4

1 × 2 : 32 : 16 × 4

2 : 32 : 64

1 : 16 : 32

d. C_2H_5OH

C × 2 : H × 6 : O

12 × 2 : 1 × 6 : 16

24 : 6 : 16

12 : 3 : 8

e. NH_3

N : H × 3

14 : 1 × 3

14 : 3

f. $CaOH_2$

Ca : O × 2 : H × 2

40 : 16 × 2 : 1 × 2

40 : 32 : 2

20 : 16 : 1

15.

Compound	**formula**	**Element present**
Quick lime	CaO	Calcium and oxygen
Hydrogen bromide	HBr	Hydrogen and bromine
Baking powder	$NaHCO_3$	Sodium, hydrogen, carbon and oxygen
Potassium sulphate	K_2SO_4	Potassium, sulphur and oxygen