1 ELEMENTS AND COMPOUNDS

Question-Answers.

Q. 1. (i) Define an element.

(ii) How many elements have been discovered by the chemists? How many of these are naturally occuring?

(iii) What are

(a) normal elements? (b) radioactive elements?

Ans. (i) Any pure substance which cannot be broken into two or more simpler substances by any chemical means is called an element.

(ii) 117 elements have been discovered by the chemists. 92 elements occur naturally.

(iii) The elements which do not give out harmful radiations are called normal elements.

The elements which give out harmful radiations are called radioactive elements.

Q. 2. (i) Define the term metal.

(ii) Give the names of any six metals along with their symbols.

Ans. (i) The elements which have lustre, are malleable, ductile and good conductors of heat and electricity are called metals.

(ii) Six common metals and their symbols are:

(a) Silver — Ag (b) Sodium — Na

(c) Potassium — K (d) Magnesium — Mg

(e) Aluminium — Al (f) Copper — Cu

Q. 3. (i) Define the term non-metal.

(ii) Give the names and the symbols of

(a) 3 non-metals which are solids.

(b) 3 non-metals which are gases.

(c) 1 non-metal which is a liquid.

Ans. (i) The elements which have no lustre, are not malleable, are non-ductile, bad conductors of heat and electricity and brittle are called non-metals.

(ii) (a) Iodine (I), Carbon (C), Sulphur (S)

(b) Hydrogen (H), Nitrogen (N), Oxygen (O)

(c) Bromine (Br)

Q. 4. **(i) What are noble gases?**
(ii) Give names and symbols of four noble gases.

Ans. (i) The elements which are found in air in small traces in the gaseous state and do not react chemically with any other elements, are called noble gases.

(ii) (a) Helium (He) (b) Neon (Ne)
(c) Argon (Ar) (d) Krypton (Kr)

Q. 5. **(i) Define (a) an atom (b) a molecule.**
(ii) Give three examples of each molecule which has
(a) Similar kind of atoms
(b) Different kinds of atom.

Ans. (i) (a) The smallest particle of an element which may or may not have independent existence, but always takes part in a chemical reaction, is called an **atom.**

(b) The smallest unit of a pure substance which always exists independently and can retain all the chemical and physical properties of that substance is called a molecule.

(ii) (a) (i) Ozone — (O_3) (ii) Nitrogen — (N_2)
(iii) Hydrogen (H_2)

(b) (i) Carbon dioxide (CO_2)
(ii) Copper sulphate ($CuSO_4$)
(iii) Sulphuric acid (H_2SO_4)

Q. 6. **What do you understand by the term compound?**

Ans. When the molecule of a pure substance contains two or more atoms of different elements combined together in a definite ratio, then it is said to be a molecule of a compound.

Q. 7. **What does each of the following formulae represent?**

Ans. (i) $2O \longrightarrow$ two atoms of oxygen
(ii) $H_2 \longrightarrow$ 1 molecule of hydrogen
(iii) $10H_2O \longrightarrow$ 10 molecules of water
(iv) $4Cl \longrightarrow$ 4 atoms of chlorine
(v) $5CO_2 \longrightarrow$ 5 molecules of carbon dioxide
(vi) $FeS \longrightarrow$ 1 molecule of iron sulphide.

Q. 8. **Write the number of atoms of each element in the following.**
(i) H_2SO_4 **(ii) $FeSO_4$** **(iii) $Pb(NO_3)_2$**

Ans. (i) 7 (ii) 6 (iii) 9

Q. 9. Write the chemical names of the following compounds.
(i) H_2SO_4 (ii) NaOH (iii) Na_2CO_3

Ans. (i) Sulphuric acid (ii) Sodium hydroxide (iii) Sodium carbonate

Q. 10. Write the chemical formula of each of the following chemical compounds.
(i) Hydrochloric acid (ii) Calcium oxide
(iii) Ferrous sulphide

Ans. (i) HCl (ii) CaO (iii) FeS

Q. 11. (i) Name two particles found inside the nucleus of an atom and state their mass and charge.
(ii) Name the particles which revolve around the nucleus and state their mass and charge.
(iii) Why is an atom of an element electrically neutral?

Ans. (i) (a) Proton has a mass of 1 amu and 1 unit positive charge.
(b) Neutron has a mass of 1 amu and no electrical charge.

(ii) Electrons having mass $\frac{1}{1837}$ times the mass of a proton and 1 unit negative charge revolve around the nucleus.

(iii) In an atom, total number of electrons (–vely charged particles) is equal to the total number of protons (+vely charged particles), and so the atom of an element is electrically neutral.

Q. 12. (i) What do you understand by the term valency?
(ii) What kind of valency do the metals generally have?
(iii) Name three elements each, whose ions have valency +1, +2, and +3 respectively.

Ans. (i) The number of electrons donated or accepted by an atom of an element so as to have 8 electrons in its outermost orbit is called valency.

(ii) Metals generally have positive valency.

(iii) Sodium, potassium and lithium have +1 valency
Magnesium, calcium and barium have +2 valency.
Chromium, aluminium and iron have +3 valency.

Q. 13. What is the valency of the underlined element in each of the following compounds?
(i) $\underline{P}Cl_3$ (ii) $\underline{Cu}Cl_2$ (iii) $\underline{Fe}O$ (iv) $\underline{Fe}_2O_3$ (v) $\underline{Ca}CO_3$

Ans. (i) +3 (ii) +2 (iii) +2 (iv) +3 (v) +2

Q. 14. (i) What is variable valency?
(ii) Give three examples of elements having variable valency.

Ans. (i) An element which exhibits more than one valency, is said to have variable valency.

(ii) Iron exhibits valencies +2 and +3.
Copper exhibits valencies +1 and +2.
Silver exhibits valencies +1 and +2.

Q. 15. Give four differences between physical and chemical change.

Ans.

Physical Change	Chemical Change
1. Specific properties of the substance do not change.	1. Specific properties of a substance change completely.
2. No new substances are produced.	2. New substances, with new chemical properties, are produced.
3. There is no net absorption or release of energy.	3. There is always a net absorption or release of energy.
4. It is a temporary change and can be reversed.	4. It is a permanent change and cannot be reversed.

Q. 16. Write the formulae of the following salts by criss-cross method.
(i) Sodium hydrogen carbonate
(ii) Ferrous sulphate **(iii) Aluminium nitride**
(iv) Potassium sulphate **(v) Ammonium chloride**
(vi) Lead nitrate **(vii) Ammonium phosphate**
(viii) Cupric oxide
(ix) Calcium hydrogen sulphate
(x) Zinc hydroxide

Ans. (i) Sodium hydrogen carbonate

Na^{+1}, HCO_3^{-1}
1 1
Na HCO_3
$NaHCO_3$

(ii) Ferrous Sulphate

Fe^{+2}, SO_4^{-2}
2 2
Fe SO_4
$FeSO_4$

(iii) Aluminium nitride

Al^{+3}, N^{-3}
3 3
Al N
AlN

(iv) Potassium sulphate

K^{+1}, SO_4^{-2}
1 2
K SO_4
K_2SO_4

(v) Ammonium chloride

NH_4^{+1}, Cl^{-1}

1 1

NH_4 Cl

NH_4Cl

(vi) Lead nitrate

Pb^{+2}, NO_3^-

2 1

Pb NO_3

$Pb(NO_3)_2$

(vii) Ammonium phosphate

NH_4^+, PO_4^{-3}

1 3

NH_4 PO_4

$(NH_4)_3PO_4$

(viii) Cupric oxide

Cu^{+2}, O^{-2}

2 2

Cu O

CuO

(ix) Calcium hydrogen sulphate

Ca^{+2}, HSO_4^{-1}

2 1

Ca HSO_4

$Ca(HSO_4)_2$

(x) Zinc hydroxide

Zn^{+2}, OH^{-1}

2 1

Zn OH

Zn $(OH)_2$

Q. 17. Write the names of the following compounds:

(i) $(NH_4)_2SO_4$ (ii) FeS (iii) NH_4OH (iv) HgO (v) ZnS

(vi) $Ca(NO_3)_2$ (vii) Na_3PO_4 (viii) $CuCO_3$ (ix) $ZnCl_2$ (x) H_2S

Ans. (i) Ammonium sulphate (ii) Ferrous sulphide (iii) Ammonium hydroxide (iv) Mercuric oxide (v) Zinc sulphide (vi) Calcium nitrate (vii) Sodium phosphate (viii) Copper carbonate (ix) Zinc chloride (x) Hydrogen sulphide

Q. 18. Balance the following equations.

(i) $\mathbf{Mg + HCl \rightarrow MgCl_2 + H_2}$

(ii) $\mathbf{Zn + O_2 \rightarrow ZnO}$

(iii) $\mathbf{NaOH + H_2SO_4 \rightarrow Na_2SO_4 + H_2O}$

(iv) $\mathbf{NaHCO_3 \rightarrow Na_2CO_3 + H_2O + CO_2}$

(v) $\mathbf{Al + S \rightarrow Al_2S_3}$

(vi) $\mathbf{Ca(OH)_2 + HNO_3 \rightarrow Ca(NO_3)_2 + H_2O}$

(vii) $\mathbf{Na_2O + H_2O \rightarrow NaOH}$

(viii) $\mathbf{CuSO_4 + Ag \rightarrow Ag_2SO_4 + Cu}$

Ans. (i) $Mg + 2HCl \rightarrow MgCl_2 + H_2$ (ii) $2Zn + O_2 \rightarrow 2ZnO$

(iii) $2NaOH + H_2SO_4 \rightarrow Na_2SO_4 + 2H_2O$

(iv) $2NaHCO_3 \rightarrow Na_2CO_3 + H_2O + CO_2$

(v) $2Al + 3S \rightarrow Al_2S_3$ (vi) $Ca(OH)_2 + 2HNO_3 \rightarrow Ca(NO_3)_2 + H_2O$

(vii) $Na_2O + H_2O \rightarrow 2NaOH$ (viii) $CuSO_4 + 2Ag \rightarrow Ag_2SO_4 + Cu$

Q. 19. What is the maximum number of electrons that can revolve around the nucleus in the (a) first orbit, (b) second orbit, (c) third orbit?

Ans. Maximum number of electrons that can revolve around the nucleus in the (a) first orbit is 2, (b) second orbit, 8 and (c) third orbit, 18.

Q. 20. Elements A and B have 3 and 6 electrons in their outermost shells, respectively.

(i) Which element will gain electrons and how many, while forming a chemical compound? What will be the electrical charge on the ion of that element?

(ii) Which element will lose electrons and how many, while forming a chemical compound? What will be the electrical charge on the ion of that element?

Ans. (i) Element B will gain 2 electrons while forming a chemical compound. There will be 2 unit negative electrical charge on the ion of that element.

(ii) Element A will lose 3 electrons while forming a chemical compound. The ion of A will get 3 units of positive charge.

Q. 21. (i) What do you mean by a physical change?

(ii) Give four common examples of a physical change.

Ans. A change which alters some specific property of matter without any change in the composition of its molecules is called a physical change. For example,

(1) glowing of an electric bulb on the passage of electric current,
(2) production of sound when two metal pieces are hit,
(3) expansion and contraction of metals with the change in temperature,
(4) crystallisation of salts from their solutions.

Q. 22. (i) What is a chemical change?

(ii) Give four examples of a chemical change.

Ans. A change which alters some specific property of a substance by bringing about a change in its molecular composition, followed by a change of state, is called a chemical change. For example,

1. cooking of food,
2. curdling of milk,
3. germination of seeds,
4. rusting of iron.

Q. 23. What are radicals? Give examples.

Ans. The group of two or more non-metals which has negative charge on it is called radical. For example,

1. carbonate (CO_3^{--})
2. sulphate (SO_4^{--})
3. acetate (CH_3COO^-)
4. phosphate (PO_4^{-3}).

Q. 24. What is a balanced chemical equation?

Ans. An equation in which the number of each atom of the elements on the reactant side is equal to the number of each atom of the elements on the product side is called a balanced chemical equation.

Q. 25. What information does a chemical formula give?

Ans. Following information are given by a chemical formula:

1. It tells which elements are present in a compound.
2. It tells the number of atoms of each element present in a compound.

Q. 26. In a chemical equation, what do the following indicate?

(i) [dil] (ii) [g] (iii) $\longrightarrow$ (iv) [conc.] (v) Δ

Ans. (i) [dil] — It indicates dilute form of an acid or a base.

(ii) [g] — It indicates the gaseous state.

(iii) $\longrightarrow$ — It indicates to yield or to form.

(v) [conc.] — It indicates concentrated form.

(v) Δ — It indicates heating.

Q. 27. What is an ion? Differentiate between a cation and an anion.

Ans. An atom which becomes charged by losing or gaining electrons is called an ion.

A positively charged ion is called a cation and a negatively charged ion is called an anion.

Q. 28. What does the formula for carbonic acid (H_2CO_3) tell you about its composition? How many atoms are contained in the formula?

Ans. Carbonic acid consists of two atoms of hydrogen, one atom of carbon and three atoms of oxygen. It thus contains 6 atoms.

Q. 29. The reaction between sodium chloride and silver nitrate forms a white precipitate of silver chloride. Write the complete balanced equation for this reaction.

Ans.

$NaCl$	+	$AgNO_3$	$\longrightarrow$	$AgCl$	+	$NaNO_3$
Sodium chloride		Silver nitrate		Silver chloride (White ppt.)		Sodium nitrate

Q. 30. How does sodium atom form its cation?

Ans. Sodium atom forms its cation by the loss of one electron.

$$\underset{\text{Sodium atom}}{Na} - e^- \longrightarrow \underset{\text{Sodium ion}}{Na^+}$$

Exercises

A. Write true or false in front of the following statements.

1. There are 80 metals discovered so far.
2. Bromine is the only liquid non-metal.
3. Argon is an example of a noble gas.
4. Valency is the number of electrons accepted by a noble gas.
5. The smallest unit of an element is called an atom.
6. The molecular formula of chlorine is Cl_4.
7. The substances formed during a chemical reaction, are called reactants.
8. Neutron is a negatively charged particle.

Ans. 1. F **2.** T **3.** T **4.** F **5.** T **6.** F **7.** F **8.** F.

B. Put a (×) mark on the item which does not belong to the rest of the group:

(i) Copper, Aluminium, Hydrogen, Iron.
(ii) Sulphur, Carbon, Magnesium, Phosphorus.
(iii) Water, Air, Carbon dioxide, Mercuric oxide.

Ans. (i) Hydrogen. It is a non-metal, rest are metals.
(ii) Magnesium. It is a metal, others are non-metals.
(iii) Air. It is a mixture, others are compounds.

C. Write balanced molecular equations for the following word equations.

1. Calcium + Oxygen → Calcium oxide
2. Calcium oxide + Water → Calcium hydroxide
3. Calcium + Water → Calcium hydroxide + Hydrogen
4. Potassium hydroxide + Hydrochloric acid → Potassium chloride + Water
5. Zinc + Sulphuric acid → Zinc sulphate + Hydrogen
6. Calcium hydroxide $\xrightarrow{\text{heat}}$ Calcium oxide + Water
7. Zinc carbonate $\xrightarrow{\text{heat}}$ Zinc oxide + Carbon dioxide
8. Lead sulphate + Ammonium hydroxide → Ammonium sulphate hydroxide

9. Copper hydroxide + Nitric acid → Copper nitrate + Water

10. Lead nitrate + Sodium chloride → Sodium nitrate + Lead chloride

Ans.

1. $2Ca + O_2 \longrightarrow 2CaO$

2. $CaO + H_2O \longrightarrow Ca(OH)_2$

3. $Ca + 2H_2O \longrightarrow Ca(OH)_2 + H_2$

4. $KOH + HCl \longrightarrow KCl + H_2O$

5. $Zn + H_2SO_4 \longrightarrow ZnSO_4 + H_2$

6. $Ca(OH)_2 \xrightarrow{\text{heat}} CaO + H_2O$

7. $ZnCO_3 \xrightarrow{\text{heat}} ZnO + CO_2$

8. $PbSO_4 + 2NH_4OH \longrightarrow (NH_4)_2\ SO_4 + Pb(OH)_2$

9. $Cu(OH)_2 + 2HNO_3 \longrightarrow Cu(NO_3)_2 + 2H_2O$

10. $Pb(NO_3)_2 + 2NaCl \longrightarrow 2NaNO_3 + PbCl_2$

D. Match the statements in Column A with those in Column B.

Column A	*Column B*
1. A subatomic particle within an atom, which is neutral in character.	**(a)** Proton
2. A positively charged particle within an atom.	**(b)** Electron
3. A negatively charged particle in an atom with a negligible mass.	**(c)** Neutron
4. The central core of an atom.	**(d)** Valency
5. Symbolic representation of one molecule of a chemical compound.	**(e)** Chemical equation
6. The substance/substances taking part in a chemical reaction.	**(f)** Nucleus
7. A statement that describes a chemical change in terms of symbols and formulae.	**(g)** Reactants
8. The number of electrons accepted or donated in the outermost shell of an atom.	**(h)** Formula

Ans. **1.** (c) **2.** (a) **3.** (b) **4.** (f) **5.** (h) **6.** (g) **7.** (e) **8.**(d)

E. Which amongst the following are physical or chemical changes?

(i) Magnetisation of iron
(ii) Respiration in animals
(iii) Formation of clouds
(iv) Lightning in the clouds
(v) Melting of glass
(vi) Cooking of food
(vii) Glowing of an electric bulb
(viii) Burning of a candle
(ix) Rusting of iron
(x) Curdling of milk

Ans. (i) Physical (ii) Chemical (iii) Physical (iv) Physical (v) Physical (vi) Chemical (vii) Physical (viii) Chemical (ix) Chemical (x) Chemical

F. Statements given below are incorrect. Write the correct statements.

1. The nucleons are protons and electrons.

Ans. Nucleons are protons and neutrons.

2. The smallest unit of a pure substance is called a compound.

Ans. The smallest unit of a pure substance is called an atom.

3. When an element accepts 2 electrons in its outermost shell, its valency is 2^+.

Ans. When an element accepts 2 electrons in its outermost shell, its valency is 2^-.

4. The symbol of the element sodium is SO.

Ans. The symbol of the element sodium is Na.

5. The formula of the compound aluminium oxide is Al_3O_2.

Ans. The formula of the compound aluminium oxide is Al_2O_3.

6. Neutrons are subatomic particles with a negative charge and negligible mass.

Ans. Electrons are subatomic particles with a negative charge and negligible mass.

7. Isotopes are atoms of the same element having the same atomic no. and mass no.

Ans. Isotopes are atoms of the same element having the same atomic number but different mass no.

8. Graphite, a non-metal, is a poor conductor of electricity.

Ans. Graphite, a non-metal, is a good conductor of electricity.

9. Both copper and magnesium show variable valency.

Ans. Copper shows variable valency.

10. The reaction between iron and copper sulphate is an example of double decomposition reaction.

Ans. The reaction between iron and copper sulphate is an example of displacement reaction.

G. State the correct formula for each of the following compounds.

1. Iron [II] chloride [$FeCl_2$/$FeCl_3$]

2. Lead [II] nitrate [$PbNO_3$/$Pb(NO_3)_2$]

3. Mercury [I] chloride [HgCl/$HgCl_2$]

4. Copper [II] oxide [CuO/Cu_2O]

5. Silver [I] chloride [$AgCl/AgCl_2$]
6. Iron [III] sulphate [$FeSO_4/Fe_2(SO_4)_3$]
7. Magnesium bicarbonate [$Mg(HCO_3)_2/MgHCO_3$]
8. Zinc oxide [$ZnO_2/ZnO/Zn_2O$]
9. Ammonium nitrate [$NH_4NO_3/(NH_4)_2\ NO_3$]
10. Sulphur trioxide [SO_2/SO_3]

Ans. 1. $FeCl_2$ **2.** $Pb(NO_3)_2$ **3.** HgCl **4.** CuO **5.** AgCl **6.** $Fe_2(SO_4)_3$ **7.** $Mg(HCO_3)_2$ **8.** ZnO **9.** NH_4NO_3 **10.** SO_3

H. Give the formulae and valencies of the following ions.

1. Ammonium **2.** Sulphate **3.** Nitrate **4.** Ferrous **5.** Hydrogen carbonate **6.** Chloride **7.** Phosphate **8.** Aluminium **9.** Hydroxide **10.** Sulphite **11.** Sulphide **12.** Carbonate

Ans.	**Formula**	**Valency**		**Formula**	**Valency**
1.	NH_4^+	1^+	**2.**	SO_4^{2-}	2^-
3.	NO_3^-	1^-	**4.**	Fe^{2+}	2^+
5.	HCO_3^-	1^-	**6.**	Cl^-	1^-
7.	PO_4^{3-}	3^-	**8.**	Al^{3+}	3^+
9.	OH^-	1^-	**10.**	SO_3^{2-}	2^-
11.	S^{2-}	2^-	**12.**	CO_3^{2-}	2^-

I. Balance the following equations.

1. $N_2 + O_2 \longrightarrow NO$
2. $K + H_2O \longrightarrow KOH + H_2$
3. $Fe + H_2O \longrightarrow Fe_3O_4 + H_2$
4. $Pb_3O_4 \longrightarrow PbO + O_2$
5. $KI + Cl_2 \longrightarrow KCl + I_2$

Ans. 1. $N_2 + O_2 \longrightarrow 2NO$
2. $2K + H_2O \longrightarrow 2KOH + H_2$
3. $3Fe + 4H_2O \longrightarrow Fe_3O_4 + 4H_2$
4. $2Pb_3O_4 \longrightarrow 6PbO + O_2$
5. $2KI + Cl_2 \longrightarrow 2KCl + I_2$

J. Give an example for each of the following and also their formulae.

(i) A diatomic molecule of an element.
(ii) A polyatomic molecule of an element.

(iii) A diatomic molecule of a gaseous compound.
(iv) A triatomic molecule of a liquid compound.
(v) A diatomic molecule of a solid element.

Ans. (i) Oxygen [O_2] (ii) Sulphur [S_8] (iii) Carbon monoxide [CO] (iv) Water [H_2O] (v) Iodine [I_2]

K. Classify these molecules into monoatomic, diatomic, triatomic and tetratomic molecules.

1. HCl **2.** O_3 **3.** H_2S **4.** P_4 **5.** CO **6.** He
7. CO_2 **8.** Au **9.** NH_3 **10.** $CaCl_2$ **11.** SO_3

1. Diatomic **2.** Triatomic **3.** Triatomic **4.** Tetratomic **5.** Diatomic
6. Monoatomic **7.** Triatomic **8.** Monoatomic **9.** Tetratomic
10. Triatomic **11.** Tetratomic

L. Name the following compounds

1. P_2O_5 **2.** PCl_3 **3.** PCl_5 **4.** CCl_4 **5.** CO **6.** SO_2 **7.** SO_3 **8.** H_2O **9.** H_2SO_4 **10.** KOH

Ans. 1. Phosphorus pentoxide **2.** Phosphorus trichloride **3.** Phosphorus pentachloride **4.** Carbon tetrachloride **5.** Carbon monoxide **6.** Sulphur dioxide **7.** Sulphur trioxide **8.** Dihydrogen oxide (water) **9.** Sulphuric acid **10.** Potassium hydroxide

M. Fill in the blanks:

1. An ..... is the smallest unit of matter.
2. A pure substance whose molecules contain two or more atoms, combined together in a ..... ratio is called a ..... .
3. ..... are particles present in the nucleus of an atom.
4. The outermost orbit of an element cannot have more than ..... electrons.
5. An element which exhibits more than ..... valency is said to exhibit ..... valency.
6. Metals have electro ..... valency and non-metals have electro ..... valency.
7. A substance taking part in a chemical reaction is called a ..... .
8. Non-metals enter into a chemical reaction by ..... electrons in their outermost shell.
9. An ..... is a charged atom.
10. ..... can neither be created nor destroyed.

11. An equation with equal number of atoms on both sides of the arrow is called a ..... chemical equation.

12. In a ..... reaction, a more reactive element replaces a less reactive element from its compound.

13. Reactions between acids and bases are ..... reactions.

14. A ..... represents one atom of a chemical element.

15. The ..... is a dense body in the centre of every atom.

16. Latin name of iron is ..... .

17. ..... is the combining capacity of elements.

18. Photosynthesis is an example of a ..... reaction.

19. ..... are malleable and ductile.

20. A non-metal which is a good conductor of heat and electricity is ..... .

21. ..... and ..... are pure substances.

22. A water molecule contains the elements ..... and ..... .

23. 2H represents ..... of hydrogen.

24. The symbolic representation of a compound is called its ..... .

25. ..... on heating gives two elements ..... and ..... .

26. The formation of a compound involves an exchange of ..... .

27. The smallest unit of a compound is an..... .

28. The atomicity of helium is ..... .

29. There are ..... normal elements.

30. Metals can be beaten into ..... and drawn into ..... .

Ans. **1.** atom **2.** definite, compound **3.** Neutrons and protons **4.** 8 **5.** one, variable **6.** positive, negative **7.** reactant **8.** accepting **9.** ion **10.** Atom **11.** balanced **12.** displacement **13.** neutralisation **14.** symbol **15.** nucleus **16.** ferrum **17.** Valency **18.** chemical **19.** Metals **20.** graphite **21.** Elements, compounds **22.** hydrogen, oxygen **23.** two atoms **24.** chemical formula **25.** Mercuric oxide, mercury, oxygen **26.** energy **27.** atom **28.** 1 **29.** 82 **30.** thin sheets, thin wires

N. Give one word for the following group of words or phrases.

1. The total number of protons and neutrons inside the nucleus.

2. The path in which electrons move round the nucleus in an atom.
3. Negatively charged atom.
4. Positively charged atom.
5. Combination of atoms of the same kind.
6. Combination of atoms of different kinds.
7. Charged component of a compound.
8. Number of atoms of different elements present in a compound.
9. Compounds of oxygen.
10. Substance that can change the speed of a reaction without being permanently changed.
11. The subatomic particle with a positive charge and unit mass.
12. A diatomic neutral gaseous molecule.
13. A compound formed between two atoms by donating one or more electrons from one atom to another.
14. The radical whose formula is : PO_4^{3-}.
15. An acid whose formula is 'H_2CO_3'.

Ans. **1.** Atomic mass **2.** Orbit **3.** Anion **4.** Cation **5.** Molecule **6.** Compound **7.** Radical **8.** Atomicity **9.** Oxides **10.** Catalyst **11.** Proton **12.** Oxygen (O_2) **13.** Covalent compound **14.** Phosphate **15.** Carbonic acid

O. Write the names of the elements present in the following compounds. Also, give their molecular formulae.

(i) Common salt (ii) Calcium oxide (iii) Sulphuric acid (iv) Glucose (v) Iron sulphide (vi) Vinegar (vii) Sugar (viii) Blue vitriol

Ans.

	Molecular formulae:	**Elements**
(i)	$NaCl$	Sodium and chlorine
(ii)	CaO	Calcium and oxygen
(iii)	H_2SO_4	Hydrogen, sulphur, oxygen
(iv)	$C_6H_{12}O_6$	Carbon, hydrogen, oxygen
(v)	FeS	Iron, sulphur
(vi)	CH_3COOH	Carbon, hydrogen, oxygen
(vii)	$C_{12}H_{22}O_{11}$	Carbon, hydrogen, oxygen
(viii)	$CuSO_4.5H_2O$	Copper, sulphur, oxygen, hydrogen

P. Tick (✓) the most appropriate answer.

1. The symbol of sodium metal is
(a) So (b) Si (c) Sm (d) Na

2. The only liquid metal at room temperature, is
(a) sodium (b) mercury (c) potassium (d) magnesium

3. The formula of one molecule of phosphorus is
(a) P (b) P_4 (c) P_6 (d) P_8

4. The process of breaking down of a chemical compound into elements, is called
(a) decomposition (b) synthesis
(c) symbiosis (d) photosynthesis

5. The symbolic representation of one molecule of a compound is called
(a) formula (b) equation (c) symbol (d) reactant

6. One molecule of oxygen is represented by the symbol
(a) 2O (b) O (c) O_2 (d) O_3

7. Sodium ion is formed
(a) by the donation of 1 electron from its outermost shell
(b) by the acceptance of 1 electron from its outermost shell
(c) by accepting one proton in its nucleus
(d) by losing one electron in its nucleus

8. The smallest particle of any substance having all the properties of that substance is called
(a) an atom (b) an element
(c) a molecule (d) a compound

9. Atomicity of a molecule is the
(a) rate of molecular movement
(b) number of its atoms staying together
(c) number of subatomic particles in an atom
(d) combining capacity of the molecule

10. Protons are particles with
(a) positive charge (b) negative charge
(c) neutral charge (d) none of the above

11. Isotopes of an element are identical in
(a) shape and size (b) mass number
(c) chemical properties (d) none of these

12. Valency of an element is the
(a) number of electrons present in an atom.
(b) combining capacity of atoms.

(c) number of atoms staying together in a molecule.
(d) all the above.

13. Which of the following equations represents a decomposition reaction?
(a) $A + B \rightarrow AB$ (b) $A + BC \rightarrow AC + B$
(c) $AB \rightarrow A + B$ (d) none of these

14. Compounds of oxygen are called
(a) chlorides (b) sulphides
(c) bromides (d) oxides

15. A charged particle of an element is called
(a) ion (b) neutron (c) radical (d) proton

16. The prefix bi- stands for
(a) 1 (b) 2 (c) 3 (d) none of these

17. In which one of the following reactions do the two compounds exchange their radicals?
(a) Double decomposition (b) Combination
(c) Decomposition (d) Displacement

18. The lightest of all elements is:
(a) oxygen (b) magnesium
(c) helium (d) hydrogen

19. A liquid metal is
(a) silver (b) mercury
(c) copper (d) sodium

20. The ratio of weight of hydrogen to oxygen in a molecule of water is
(a) 2:1 (b) 1:8 (c) 8:1 (d) 1:2

21. The valency of chromium in chromium oxide (Cr_2O_3) is
(a) 2 (b) 6 (c) 3 (d) 4

Ans. **1.** (d) **2.** (b) **3.** (b) **4.** (a) **5.** (a) **6.** (c) **7.** (a) **8.** (c) **9.** (b) **10.** (a) **11.** (c) **12.** (b) **13.** (c) **14.** (d) **15.** (a) **16.** (b) **17.** (a) **18.** (d) **19.** (b) **20.** (b) **21.** (c).

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