

7.ATOMS AND MOLECULES**I. Choose the best answer:**

- Which of the following has the smallest mass?
 - 6.023×10^{23} atoms of He
 - 1 atom of He
 - 2g of He
 - 1 mole atoms of He
- Which of the following is a triatomic molecule?
 - Glucose
 - Helium
 - Carbon dioxide
 - Hydrogen
- Mass of 1 mole of Nitrogen atom is
 - 28 amu
 - 14 amu
 - 28g
 - 14g
- Which of the following represents 1amu?
 - Mass of a C-12 atom
 - Mass of a hydrogen atom
 - $1/12^{\text{th}}$ of the mass of a C-12 atom
 - Mass of O -16 atom
- In the nucleus of ${}_{20}\text{Ca}^{40}$, there are
 - 20 protons and 40 neutrons
 - 20 protons and 20 neutrons
 - 20 protons and 40 electrons
 - 40 protons and 20 electrons
- The gram molecular mass of oxygen molecule is
 - 16g
 - 18g
 - 32g
 - 17g
- 1 mole of any substance contains _____ molecules.
 - 6.023×10^{23}
 - 6.023×10^{-23}
 - 3.0115×10^{23}
 - 12.046×10^{23}

II. Fill in the blanks

- Atoms of different elements having __ mass number, but __ atomic numbers are called isobars.
- Atoms of different elements having same number of _____ are called isotones.
- Atoms of one element can be transmuted into atoms of other element by _____
- The sum of the numbers of protons and neutrons of an atom is called its _____
- Relative atomic mass is otherwise known as _____
- If a molecule is made of similar kind of atoms, then it is called _____ atomic molecule
- The number of atoms present in a molecule is called its _____
- One mole of any gas occupies _____ ml at S.T.P
- Atomicity of phosphorous is _____

III. Match the following

- | | | |
|------------------------------|---|------------|
| 1. 8 g of O ₂ | - | 4 moles |
| 2. 4 g of H ₂ | - | 0.25 moles |
| 3. 52 g of He | - | 2 moles |
| 4. 112 g of N ₂ | - | 0.5 moles |
| 5. 35.5 g of Cl ₂ | - | 13 moles |

IV. True or False: (If false give the correct statement)

- Two elements sometimes can form more than one compound (d)
- Noble gases are Diatomic
- The gram atomic mass of an element has no unit
- 1 mole of Gold and Silver contain same number of atoms
- Molar mass of CO₂ is 42g.

V. Assertion and Reason:

Answer the following questions using the data given below:

- A and R are correct, R explains the (A)
 - A is correct, R is wrong.
 - A is wrong, R is correct.
 - A and R are correct, R doesn't explains (A)
- Assertion:** The Relative Atomic mass of aluminium is 27
Reason: An atom of aluminium is 27 times heavier than $1/12^{\text{th}}$ of the mass of the C- 12 atom.

2. **Assertion:** The Relative Molecular Mass of Chlorine is 35.5 a.m.u.

Reason: The natural abundance of Chlorine isotopes are not equal.

8.PERIODIC CLASSIFICATION OF ELEMENTS

I. Choose the best answer:

- The number of periods and groups in the periodic table are _____.
(a) 6,16 (b)7,17 (c) 8,18 (d) 7,1
- The basis of modern periodic law is _____.
(a) atomic number (b)atomic mass (c)isotopic mass (d)number of neutrons
- _____group contains the member of halogen family.
(a) 17th (b)15th (c)18th (d)16th
- _____ is a relative periodic property
a) atomic radii (b) ionic radii (c) electron affinity (d) electro negativity
- Chemical formula of rust is _____.
(a) FeO.xH₂O (b) FeO₄.xH₂O (c) Fe₂O₃.xH₂O (d) FeO
- In the alumino thermic process the role of Al is _____.
(a) oxidizing agent (b) reducing agent
(c) hydrogenating agent (d) sulphurising agent
- The process of coating the surface of metal with a thin layer of zinc is called _____.
(a) Painting (b) thinning (c) galvanization (d) electroplating
- Which of the following have inert gases 2 electrons in the outermost shell?
(a) He (b) Ne (c) Ar (d) Kr
- Neon shows zero electron affinity due to _____.
(a) stable arrangement of neutrons (b) stable configuration of electrons
(c) reduced size (d) increased density
- _____ is an important metal to form amalgam.
(a) Ag (b) Hg (c) Mg (d) Al

II. Fill in the blanks

- If the electro negativity difference between two bonded atoms in a molecule is greater than 1.7, the nature _____
- _____ is the longest period in the periodical table
- _____ forms the basis of modern periodic table
- If the distance between two Cl atoms in Cl₂ molecule is 1.98Å, then the radius of Cl atom is _____
- Among the given species A⁻, A⁺, and A, the smallest one in size is _____.
- The scientist who propounded the modern periodic law is _____.
- Across the period, ionic radii _____ (increases, decreases).
- _____ and _____ are called inner transition elements.
- _____ and _____ are called inner transition elements.
- The chemical name of rust is _____.

III. Match the following

- | | | |
|----------------------|---|-------------------------------|
| 1. Galvanisation | - | Noble gas elements |
| 2. Calcination | - | Coating with Zn |
| 3. Redox reaction | - | Silver-tin amalgam |
| 4. Dental filling | - | Alumino thermic process |
| 5. Group 18 elements | - | Heating in the absence of air |

IV. True or False: (If false give the correct statement)

- Moseley's periodic table is based on atomic mass.
- Ionic radius increases across the period from left to right.
- All ores are minerals; but all minerals cannot be called as ores;
- Al wires are used as electric cables due to their silvery white colour.
- An alloy is a heterogenous mixture of metals.

V. Assertion and Reason

Answer the following questions using the data given below:

- i) A and R are correct, R explains the (A)
 - ii) A is correct, R is wrong.
 - iii) A is wrong, R is correct.
 - iv) A and R are correct, R doesn't explain (A)
1. **Assertion** : The nature of bond in HF molecule is ionic
Reason : The electro negativity difference between H and F is 1.9
 2. **Assertion** : Magnesium is used to protect steel from rusting
Reason : Magnesium is more reactive than iron
 3. **Assertion** : An uncleaned copper vessel is covered with greenish layer.
Reason : copper is not attacked by alkali

9.SOLUTIONS**I. Choose the correct answer.**

1. A solution is a _____ mixture.
 - (a) homogeneous
 - (b) heterogeneous
 - (c) homogeneous and heterogeneous
 - (d) non homogeneous
2. The number of components in a binary solution is _____
 - (a) 2
 - (b) 3
 - (c) 4
 - (d) 5
3. Which of the following is the universal solvent?
 - (a) Acetone
 - (b) Benzene
 - (c) Water
 - (d) Alcohol
4. A solution in which no more solute can be dissolved in a definite amount of solvent at a given temperature is called _____.
 - (a) Saturated solution
 - (b) Un saturated solution
 - (c) Super saturated solution
 - (d) Dilute solution
5. Identify the non aqueous solution.
 - (a) sodium chloride in water
 - (b) glucose in water
 - (c) copper sulphate in water
 - (d) sulphur in carbon-di-sulphide
6. When pressure is increased at constant temperature the solubility of gases in liquid _____.
 - (a) No change
 - (b) increases
 - (c) decreases
 - (d) no reaction
7. Solubility of NaCl in 100 ml water is 36 g. If 25 g of salt is dissolved in 100 ml of water how much more salt is required for saturation _____.
 - (a) 12g
 - (b) 11g
 - (c) 16g
 - (d) 20g
8. A 25% alcohol solution means
 - (a) 25 ml alcohol in 100 ml of water
 - (b) 25 ml alcohol in 25 ml of water
 - (c) 25 ml alcohol in 75 ml of water
 - (d) 75 ml alcohol in 25 ml of water
9. Deliquescence is due to _____.
 - (a) Strong affinity to water
 - (b) Less affinity to water
 - (c) Strong hatred to water
 - (d) Inertness to water
10. Which of the following is hygroscopic in nature?
 - (a) ferric chloride
 - (b) copper sulphate penta hydrate
 - (c) silica gel
 - (d) none of the above

II. Fill in the blanks

1. The component present in lesser amount, in a solution is called _____
2. Example for liquid in solid type solution is _____
3. Solubility is the amount of solute dissolved in _____ g of solvent.
4. Polar compounds are soluble in _____ solvents
5. Volume percentage decreases with increases in temperature because _____

kindly send me your key Answers to our email id - padasalai.net@gmail.com

III. Match the following

- | | | |
|------------------|---|--------------------------------------|
| 1. Blue vitriol | – | CaSO ₄ .2H ₂ O |
| 2. Gypsum | – | CaO |
| 3. Deliquescence | – | CuSO ₄ .5H ₂ O |
| 4. Hygroscopic | – | NaOH |

IV. True or False: (If false give the correct statement)

- Solutions which contain three components are called binary solution.
- In a solution the component which is present in lesser amount is called solvent.
- Sodium chloride dissolved in water forms a non-aqueous solution.
- The molecular formula of green vitriol is MgSO₄.7H₂O
- When Silica gel is kept open, it absorbs moisture from the air, because it is hygroscopic in nature.

10.TYPES OF CHEMICAL REACTIONS**I. Choose the correct answer.**

- $H_{2(g)} + Cl_{2(g)} \rightarrow 2HCl_{(g)}$ is a

(a) Decomposition Reaction	(b) Combination Reaction
(c) Single Displacement Reaction	(d) Double Displacement Reaction
- Photolysis is a decomposition reaction caused by _____

(a) heat	(b) electricity	(c) light	(d) mechanical energy
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- A reaction between carbon and oxygen is represented by $C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)} + \text{Heat}$. In which of the type (s), the above reaction can be classified?

(i) Combination Reaction	(ii) Combustion Reaction		
(iii) Decomposition Reaction	(iv) Irreversible Reaction		
(a) i and ii	(b) i and iv	(c) i, ii and iii	(d) i, ii and iv
- The chemical equation $Na_2SO_{4(aq)} + BaCl_{2(aq)} \rightarrow BaSO_{4(s)} \downarrow + 2NaCl_{(aq)}$ represents which of the following types of reaction?

(a) Neutralization	(b) Combustion	(c) Precipitation	(d) Single displacement
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- Which of the following statements are correct about a chemical equilibrium?

(i) It is dynamic in nature	(ii) The rate of the forward and backward reactions are equal at equilibrium		
(iii) Irreversible reactions do not attain chemical equilibrium	(iv) The concentration of reactants and products may be different		
(a) i, ii and iii	(b) i, ii and iv	(c) ii, iii and iv	(d) i, iii and iv
- A single displacement reaction is represented by $X_{(s)} + 2HCl_{(aq)} \rightarrow XCl_{2(aq)} + H_{2(g)}$. Which of the following (s) could be X. (i) Zn (ii) Ag (iii) Cu (iv) Mg.
Choose the best pair.

(a) i and ii	(b) ii and iii	(c) iii and iv	(d) i and iv
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- Which of the following is not an “element + element \rightarrow compound” type reaction?

(a) $C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)}$	(b) $2K_{(s)} + Br_{2(l)} \rightarrow 2KBr_{(s)}$
(c) $2CO_{(g)} + O_{2(g)} \rightarrow 2CO_{2(g)}$	(d) $4Fe_{(s)} + 3O_{2(g)} \rightarrow 2Fe_2O_{3(s)}$
- Which of the following represents a precipitation reaction?

(a) $A_{(s)} + B_{(s)} \rightarrow C_{(s)} + D_{(s)}$	(b) $A_{(s)} + B_{(aq)} \rightarrow C_{(aq)} + D_{(l)}$
(c) $A_{(aq)} + B_{(aq)} \rightarrow C_{(s)} + D_{(aq)}$	(d) $A_{(aq)} + B_{(s)} \rightarrow C_{(aq)} + D_{(l)}$
- The pH of a solution is 3. Its [OH⁻] concentration is

(a) 1×10^{-3} M	(b) 3 M	(c) 1×10^{-11} M	(d) 11 M
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- Powdered CaCO₃ reacts more rapidly than flaky CaCO₃ because of _____.

(a) large surface area	(b) high pressure	(c) high concentration	(d) high temperature
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II. Fill in the blanks

1. A reaction between an acid and a base is called _____.
2. When lithium metal is placed in hydrochloric acid, _____ gas is evolved (d)
3. The equilibrium attained during the melting of ice is known as _____.
4. The pH of a fruit juice is 5.6. If you add slaked lime to this juice, its pH ____ (increase /decrease)
5. The value of ionic product of water at 25°C is _____.
6. The normal pH of human blood is _____
7. Electrolysis is type of _____ reaction
8. The number of products formed in synthesis reaction is _____
9. Chemical volcano is an example for _____ type of reaction
10. The ion formed by dissolution of H^+ in water is called _____

III. Match the following

1. Identify the types of reaction

REACTION	TYPE
$NH_4OH_{(aq)} + CH_3COOH_{(aq)} \rightarrow CH_3COONH_4_{(aq)} + H_2O_{(l)}$	Single Displacement
$Zn_{(s)} + CuSO_4_{(aq)} \rightarrow ZnSO_4_{(aq)} + Cu_{(s)}$	Combustion
$ZnCO_3_{(s)} + Heat \rightarrow ZnO_{(s)} + CO_2_{(g)}$	Neutralisation
$C_2H_4_{(g)} + 4O_2_{(g)} \rightarrow 2CO_2_{(g)} + 2H_2O_{(g)} + Heat$	Thermal decomposition

IV. True or False: (If false give the correct statement)

1. Silver metal can displace hydrogen gas from nitric acid
2. The pH of rain water containing dissolved gases like SO_3 , CO_2 , NO_2 will be less than 7.
3. At the equilibrium of a reversible reaction, the concentration of the reactants and the products will be equal.
4. Periodical removal of one of the products of a reversible reaction increases the yield.
5. On dipping a pH paper in a solution, it turns into yellow. Then the solution is basic.

11. CARBON AND ITS COMPOUNDS**I. Choose the best answer.**

1. The molecular formula of an open chain organic compound is C_3H_6 . The class of the compound is
 (a) alkane (b) alkene (c) alkyne (d) alcohol
2. The IUPAC name of an organic compound is 3-Methyl butan-1-ol. What type compound it is?
 (a) Aldehyde (b) Carboxylic acid (c) Ketone (d) Alcohol
3. The secondary suffix used in IUPAC nomenclature of an aldehyde is _____
 (a) - ol (b) - oic acid (c) - al (d) - one
4. Which of the following pairs can be the successive members of a homologous series?
 (a) C_3H_8 and C_4H_{10} (b) C_2H_2 and C_2H_4 (c) CH_4 and C_3H_6 (d) C_2H_5OH and C_4H_8OH
5. $C_2H_5OH + 3O_2 \rightarrow 2CO_2 + 3H_2O$ is a
 (a) Reduction of ethanol (b) Combustion of ethanol
 (c) Oxidation of ethanoic acid (d) Oxidation of ethanal
6. Rectified spirit is an aqueous solution which contains about _____ of ethanol
 (a) 95.5 % (b) 75.5 % (c) 55.5 % (d) 45.5 %
7. Which of the following are used as anaesthetics?
 (a) Carboxylic acids (b) Ethers (c) Esters (d) Aldehydes
8. TFM in soaps represents _____ content in soap
 (a) mineral (b) vitamin (c) fatty acid (d) carbohydrate
9. Which of the following statements is wrong about detergents?
 (a) It is a sodium salt of long chain fatty acids (b) It is sodium salts of sulphonic acids
 (c) The ionic part in a detergent is $-SO_3^-Na^+$ (d) It is effective even in hard water.

II. Fill in the blanks

1. An atom or a group of atoms which is responsible for chemical characteristics of an organic Compound is called _____.
2. The general molecular formula of alkynes is _____
3. In IUPAC name, the carbon skeleton of a compound is represented by _____ (root word / prefix / suffix)
4. (Saturated / Unsaturated) _____ compounds decolourize bromine water.
5. Dehydration of ethanol by con(c) Sulphuric acid forms _____ (ethene/ ethane)
6. 100 % pure ethanol is called _____
7. Ethanoic acid turns _____ litmus to _____
8. The alkaline hydrolysis of fatty acids is termed as _____
9. Biodegradable detergents are made of _____ (branched / straight) chain hydrocarbons

III. Match the following

- | | | |
|-----------------------|---|--------------------|
| 1)Functional group–OH | - | Benzene |
| 2)Heterocyclic | - | Potassium stearate |
| 3)Unsaturated | - | Alcohol |
| 4)Soap | - | Furan |
| 5)Carbocyclic | - | Ethene |

IV. Assertion and Reason:

Answer the following questions using the data given below:

- i) A and R are correct, R explains the (A)
 - ii) A is correct, R is wrong.
 - iii) A is wrong, R is correct.
 - iv) A and R are correct, R doesn't explain (A)
1. **Assertion:** Detergents are more effective cleansing agents than soaps in hard water.
Reason: Calcium and magnesium salts of detergents are water soluble.
 2. **Assertion:** Alkanes are saturated hydrocarbons.
Reason: Hydrocarbons consist of covalent bonds.