Question Set 3

Multiple Choice Questions

Q. Choose the correct answer out of the four available choices A, B, C and D given under each question :

Chapter 1. Periodic Properties and Variations of Properties

1. In the periodic table, alkali metals are placed in the group :
   (a) 1 (b) 11
   (c) 17 (d) 18

2. An alkaline earth metal is :
   (a) Palarium (b) Calcium
   (c) Lead (d) Copper

3. The number of electrons present in the valence shell of halogen is :
   (a) 1 (b) 3
   (c) 5 (d) 7

4. If an element A belongs to period 3 and Group II then it will have :
   (a) 3 shells and 2 valence electrons
   (b) 2 shells and 3 valence electrons
   (c) 3 shells and 3 valence electrons
   (d) 2 shells and 2 valence electrons

5. On moving from left to right across a period of the periodic table, the atomic size :
   (a) Decreases
   (b) Increases
   (c) Remains the same
   (d) Sometimes increases and sometimes decreases

6. On moving from left to right across a period of the periodic table, the non-metallic character of the elements :
   (a) Decreases (b) Increases
   (c) Remains the same (d) Depends on the period

7. On moving from left to right across a period of the periodic table, the ionization potential :
   (a) Goes up and down (b) Decreases
   (c) Increases (d) Remains the same

8. Ionisation potential increases over a period from left to right because the :
   (a) Atomic radius increases and nuclear charge increases
   (b) Atomic radius decreases and nuclear charge decreases
   (c) Atomic radius increases and nuclear charge decreases
   (d) Atomic radius decreases and nuclear charge increases

9. On moving from left to right across a period of the periodic table, the electron affinity of the elements in groups 1 to 7 :
   (a) Goes up and then down (b) Decreases and then increases
   (c) Increases (d) Decreases

10. An element in period 3 whose electron affinity is zero :
    (a) Neon (b) Sulphur
    (c) Sodium (d) Argon

11. Among the period 2 elements, the element which has high electron affinity is :
    (a) Lithium (b) Carbon
    (c) Chlorine (d) Fluorine

12. On moving from left to right across a period of the periodic table, the electronegativity :
    (a) Depends on the number of valence electrons
    (b) Remains the same
    (c) Decreases
    (d) Increases

13. Among the elements given below, the element with the least electronegativity is :
    (a) Lithium (b) Carbon
    (c) Boron (d) Fluorine

14. Which of the following would weigh the least ?
    (a) 2g atoms of nitrogen (b) 1 mole of silver
    (c) 22·4 litres of oxygen gas at 1 atmospheric pressure and 273 K
    (d) $6{\cdot}02 \times 10^{23}$ atoms of carbon

    [Atomic masses : Ag = 108, N = 14, O = 16, C = 12]

15. The ratio between the number of molecules in 2 g of hydrogen and 32 g of oxygen is :
    (a) 1 : 2 (b) 1 : 0·01
    (c) 1 : 1 (d) 0·01 : 1 [Given that H = 1, O = 16]

16. An element with the atomic number 19 will most likely combine chemically with the element whose atomic number is :
    (a) 17 (b) 11
    (c) 18 (d) 20

Ans.

(1)	(a)	(2)	(b)	(3)	(d)	(4)	(a)
(5)	(a)	(6)	(b)	(7)	(c)	(8)	(d)
(9)	(c)	(10)	(d)	(11)	(d)	(12)	(d)
(13)	(a)	(14)	(d)	(15)	(c)	(16)	(a).

Chapter 2. Chemical Bonding

1. Molecular reactions which are generally slow reactions are shown by :
   (a) Covalent compounds (b) Ionic compounds
   (c) Co-ordinate compounds (d) Both ionic and covalent compounds

2. The number of electrons lost or gained by an atom refers to :
   (a) Electrovalency (b) Covalency
   (c) Donation (d) Acceptance

3. The capacity of an atom to attract the shared pair of electrons towards itself is called :
   (a) Electronegativity (b) Electron affinity
   (c) Sharing of electrons (d) Electron donation

4. Which of the following doesn't represent oxidation ?
   (a) Loss of electrons (b) Addition of oxygen
   (c) Increase in oxidation number (d) Addition of hydrogen

5. Sodium and sodium ions :
   (a) Are chemically same (b) Have same number of electrons
   (c) Have same number of protons (d) None of the above

6. A compound which contains all the three types of bonds *i.e.*, ionic, covalent and co-ordinate is :
   (a) Sodium chloride (b) Ammonia
   (c) Calcium chloride (d) Ammonium chloride

7. The most ionic compound of periodic table is :
   (a) Sodium chloride (b) Potassium chloride
   (c) Magnesium chloride (d) Caesium chloride

8. The molecule containing a triple covalent bond is :
   (a) Ammonia (b) Methane
   (c) Water (d) Nitrogen

9. A compound having one lone pair of electrons :
   (a) Water (b) Methane
   (c) Ammonia (d) Hydrogen sulphide

10. A compound X consists of only molecules. Hence X will have :
   (a) A crystalline hard structure
   (b) A low melting point and low boiling point
   (c) An ionic bond
   (d) A strong force of attraction between its molecules

11. Bonding in this molecule can be understood to involve coordinate bonding :
   (a) Carbontetrachloride (b) Hydrogen
   (c) Hydrogen chloride (d) Ammonium chloride

12. Which of the following is a common characteristic of a covalent compound ?
   (a) High melting point
   (b) Consists of molecules
   (c) Always soluble in water
   (d) Conducts electricity when it is in the molten state

Ans.

(1)	(d)	(2)	(a)	(3)	(a)	(4)	(d)
(5)	(c)	(6)	(d)	(7)	(d)	(8)	(d)
(9)	(c)	(10)	(b)	(11)	(d)	(12)	(b)

Chapter 3. Study of Acids, Bases and Salts

1. A particular solution contains molecules and ions of the solute so it is a :
   (a) Weak acid (b) Strong acid
   (c) Strong base (d) Salt solution

2. Select the acid which contains four hydrogen atoms in it :
   (a) Formic acid (b) Sulphuric acid
   (c) Nitric acid (d) Acetic acid

3. An organic weak acid is :
   (a) Formic acid (b) Sulphuric acid
   (c) Nitric acid (d) Hydrochloric acid

4. The aqueous solution of the following compounds which contains both ions and molecules is :
   (a) Sulphuric acid (b) Hydrochloric acid
   (c) Nitric acid (d) Acetic acid

5. An acid which is not a hydro acid is :
   (a) H_2S (b) H_2SO_3
   (c) HBr (d) HCl

6. Which one of the following will not produce an acid when made to react with water ?
   (a) Carbon monoxide (b) Carbon dioxide
   (c) Nitrogen dioxide (d) Sulphur trioxide

7. The metal oxide which can react with acid as well as alkali is :
   (a) Silver oxide (b) Copper (II) oxide
   (c) Aluminium oxide (d) Calcium oxide

8. During ionization metals lose electrons, this change can be called :
   (a) Oxidation (b) Reduction
   (c) Redox (d) Displacement

9. The salt which in solution gives a pale green precipitate with sodium hydroxide solution and a white precipitate with barium chloride solution is :
   (a) Iron (III) sulphate (b) Iron (II) sulphate
   (c) Iron (II) chloride (d) Iron (III) chloride

10. An example of a complex salt is :
    (a) Zinc sulphate
    (b) Sodium hydrogensulphate
    (c) Iron (II) ammonium sulphate
    (d) Tetrammine copper (II) sulphate

11. To increase the pH value of neutral solution, we should add :
    (a) An acid
    (b) An acid salt
    (c) An alkali
    (d) A salt

Ans. (1) (a) (2) (d) (3) (a) (4) (c)
(5) (b) (6) (a) (7) (c) (8) (a)
(9) (b) (10) (d) (11) (c).

Chapter 4. Analytical Chemistry

1. Salts of which elements are generally coloured :
   (a) Transition (b) Normal
   (c) Lanthanides (d) Inner-transition.

2. Which one of the following salt solutions on reaction with excess of ammonium hydroxide solution gives a deep blue solution ?
   (a) $FeCl_3$ (aq.) (b) $CuSO_4$ (aq.)
   (c) $Al_2(SO_4)_3$ (aq.). (d) $ZnSO_4$ (aq.)

3. Which one of the following salt solutions on reaction with excess sodium hydroxide solution gives a clear solution finally ?
   (a) $(PbNO_3)_2$ (aq) (b) $CuSO_4$ (aq)
   (c) $FeCl_3$ (aq) (d) $ZnSO_4$ (aq.)

4. The precipitate of which of the following compounds is soluble in excess of ammonia solution ?
   (a) Iron (II) chloride (b) Magnesium chloride
   (c) Copper (II) sulphate (d) Lead nitrate

5. Which one of the following salt solutions on reaction with excess of ammonium hydroxide solution results finally in dissolution of the precipitate first formed ?
   (a) $AlCl_3$ (aq.) (b) $FeSO_4$ (aq.)
   (c) $Fe(SO_4)_3$ (aq.) (d) $ZnSO_4$ (aq.)

6. Hydroxide of this metal is soluble in sodium hydroxide solution.
   (a) Magnesium (b) Lead
   (c) Silver (d) Copper

7. The hydroxide which is soluble in excess of NaOH is :
   (a) $Zn(OH)_2$ (b) $Fe(OH)_2$
   (c) $Fe(OH)_3$ (d) $Al(OH)_3$

8. Name the reagent from the following which can be used to distinguish zinc nitrate solution from magnesium nitrate.
   (a) NH_4OH (aq.) (b) NaOH (aq.)
   (c) $BaCl_2$ (d) H_2SO_4

9. The oxide and hydroxide of which metal is amphoteric :
   (a) Zinc (b) Copper
   (c) Iron (d) Manganese

10. Anhydrous iron (III) chloride is prepared by :
    (a) Direct combination (b) Simple displacement
    (c) Decomposition (d) Neutralization

11. A chloride which forms a precipitate that is soluble in excess of ammonium hydroxide is :
    (a) Calcium chloride (b) Ferrous chloride
    (c) Ferric chloride (d) Copper chloride

Ans. (1) (b) (2) (b) (3) (a) (4) (c)
(5) (d) (6) (b) (7) (a) (8) (a)
(9) (a) (10) (a) (11) (d).

Chapter 5. Mole Concept and Stoichiometry

1. The temperature at which all molecular motion ceases is :
   (a) 0°C (b) 100°C
   (c) Zero power (d) Absolute zero

2. The volume occupied by 1 mole of gas at STP is :
   (a) 2·24 litres (b) 22·4 litres
   (c) 2·42 litres (d) 2·44 litres

3. The volume occupied by 7 g of nitrogen at STP is :
   (a) 5·4 litres (b) 4·8 litres
   (c) 5·6 litres (d) 4·6 litres

4. Which law states that "under the same conditions of temperature and pressure, equal volumes of all gases contain the same number of molecule."
   (a) Avogadro's law (b) Gay Lussac's Law
   (c) Mole Law (d) Law of conservation of mass

5. What is the value of Avogadro number ?
   (a) $6{\cdot}022 \times 10^{23}$ (b) $6{\cdot}022 \times 10^{-23}$
   (c) $6{\cdot}22 \times 10^{23}$ (d) $6{\cdot}22 \times 10^{-23}$

6. One atomic mass unit is how much part the mass of carbon-12 atoms ?
   (a) $\frac{1}{4}$ (b) $\frac{1}{12}$
   (c) $\frac{1}{8}$ (d) $\frac{1}{16}$

7. The number of atoms present in one molecule of an element is called its :
   (a) Molecular number (b) Atomic number
   (c) Avogadro's number (d) Atomicity

8. The vapour density of carbon dioxide [C = 12, O = 16] is :
   (a) 12 (b) 16
   (c) 44 (d) 22

9. The empirical formula of hexane is :
   (a) C_2H_7 (b) C_5H_8
   (c) C_3H_7 (d) C_4H_7

10. If empirical formula of an organic compound is CH_2O then its molecular formula can be :
    (a) $C_2H_2O_2$ (b) C_2H_4O
    (c) C_3H_6O (d) $C_6H_{12}O_6$

Ans. (1) (d) (2) (b) (3) (c) (4) (a)
(5) (a) (6) (b) (7) (d) (8) (d)
(9) (c) (10) (d).

Chapter 6. Electrolysis

1. Identify the weak electrolyte from the following :

   (a) Sodium Chloride solution
   (b) Dilute Hydrochloric acid
   (c) Dilute Sulphuric acid
   (d) Aqueous acetic acid

2. Which of these will act as a non-electrolyte ?
   (a) Liquid carbon tetrachloride
   (b) Acetic acid
   (c) Sodium hydroxide aqueous solution
   (d) Potassium chloride aqueous solution

3. During ionisation metals lose electrons, this change can be called :
   (a) Oxidation (b) Reduction
   (c) Redox (d) Displacement

4. The metallic electrode which does not take part in an electrolytic reaction.
   (a) Cu (b) Ag
   (c) Pt (d) Ni

5. When dilute sodium chloride is electrolysed using graphite electrodes, the cation is discharged at the cathode most readily.
   (a) Na^+ (b) OH^-
   (c) H^+ (d) Cl^-

6. During electrolysis of NaCl, the gas released at anode is :
   depends molten or aq
   (a) Chlorine (b) Oxygen
   (c) Hydrogen (d) None of the above

7. During the electrolysis of molten lead bromide which of the following takes place :
   (a) Bromine is released at the cathode
   (b) Lead is deposited at the anode
   (c) Bromine ions gain electrons
   (d) Lead is deposited at the cathode

8. A compound which liberates reddish brown gas around the anode during electrolysis in its molten state is :
   (a) Sodium chloride (b) Copper (II) oxide
   (c) Copper (II) sulphate (d) Lead (II) bromide

9. When fused lead bromide is electrolysed we observe :
   (a) a silver grey deposit at anode and a reddish brown deposit at cathode
   (b) a silver grey deposit at cathode and a reddish brown deposit at anode
   (c) a silver grey deposit at cathode and reddish brown fumes at anode
   (d) silver grey fumes at anode and reddish brown fumes at cathode.

10. The vessel in which electrolysis of Lead bromide is carried out is :
    (a) Clay crucible (b) Glass vessel
    (c) Silica crucible (d) Aluminium vessel

11. The ion which is discharged at the cathode during the electrolysis of copper sulphate solutions using copper electrodes as anode and cathode.
    (a) Cu^{2+} (b) OH^-
    (c) SO_4^{2-} (d) H^+

12. An aqueous electrolyte consists of the ions mentioned in the list, the ion which could be discharged most readily during electrolysis.
    (a) Fe^{2+} (b) Cu^{2+}
    (c) Pb^{2+} (d) H^+

13. During silver plating of an article using potassium argentocyanide as an electrolyte, the anode material should be :
    (a) Cu (b) Ag
    (c) Pt (d) Fe

14. The particles present in strong electrolytes are :
    (a) only molecules (b) mainly ions
    (c) ions and molecules (d) only atoms

Ans.

(1) (d)	(2) (a)	(3) (a)	(4) (c)
(5) (c)	(6) (b)	(7) (d)	(8) (d)
(9) (c)	(10) (c)	(11) (a)	(12) (b)
(13) (b)	(14) (b)		