10. Oil .....
11. Phosphorus .....
12. Rubber .....
13. Shellac .....
14. Copper sulphate .....
15. Iron (II) sulphide .....
16. Iron .....
17. Common salt .....
18. Soap .....

Q. 22. Sodium metal is a pure substance and so is sodium chloride, inspite of the fact that sodium chloride contains two different elements. Give one reason to explain your answer.

.....

.....

Q. 23. Give reasons for the following :

(*i*) Air is a mixture. .....

.....

.....

(*ii*) Milk is a mixture and not a pure substance. .....

.....

.....

(*iii*) Sugar is a pure substance but not a mixture. .....

.....

.....

.....

(*iv*) Wax is regarded as a mixture and not a pure substance. .....

.....

.....

Q. 24. Why decantation is considered an inferior method for separating insoluble solids from a suspension ?

.....

.....

Q. 25. State two advantages of chromatography over other methods of separation.

(*i*) .....

(*ii*) .....

Q. 26. Hydrogen is a combustible gas which burns in oxygen and oxygen supports the combustion of burning substances. Yet, water (a compound of hydrogen and oxygen) does not burn but extinguishes burning substances. Explain.

.....

.....

Q. 27. Indicate which out of the following statements are true and which are false?

(*i*) An element cannot be formed from simpler substances : .....

(*ii*) The composition of a mixture is fixed : .....

(*iii*) The constituents of a compound can be separated by physical means :

.....

(*iv*) A mixture has characteristic properties of its own : .....

(*v*) Most of the elements are solids under ordinary conditions : .....

(*vi*) Mixture of iodine and solid ammonium chloride can be separated by sublimation.

.....

(*vii*) A pure substance may be homogeneous or heterogeneous : .....

(*viii*) Mixtures are always homogeneous. .....

(*ix*) A mixture of two immiscible liquids is best separated by a separating funnel :

.....

(*x*) Components of colouring matter in ink are best separated by chromatography :

.....

(*xi*) The most abundant element in human body is hydrogen : .....

(*xii*) Tungsten is a good conductor of electricity : .....

(*xiii*) Alumina and silica gel are used as adsorbents in chromatography :

.....

(*xiv*) Two elements can combine to form a single compound : .....

(*xv*) A mixture of two miscible liquids is best separated by fractional distillation:

.....

Q. 28. Give two uses of fractional distillation in industry.

.....

.....

Q. 29. Explain how would you separate the following mixtures :

(*a*) Benzene + Toluene

.....

.....

.....

(*b*) Carbon tetrachloride + Water

.....

.....

.....

Q. 30. Fill in the blanks by choosing the correct word or letter from those given in the brackets.

(*i*) Iodised salt is a .....mixture of sodium chloride and potassium iodide. (homogeneous, heterogeneous)

(*ii*) Steel is a ..... mixture of iron and carbon. (homogeneous, heterogeneous)

(*iii*) The components of liquid air may be separated by..... (distillation, fractional distillation)

(*iv*) Two elements which constitute three-fourths of the earth's crust are ..... and ..... . (oxygen, nitrogen, silicon)

(*v*) Atomicity of phosphorus is ..... and that of sulphur is ..... (2, 4, 1, 8)

(*vi*) Three elements which make up more than 90% of the human body are ....., ... and ..... . (carbon, hydrogen, oxygen, sulphur, phosphorus)

(*vii*) A liquid metal is ..... . (Sn, Hg)

(*viii*) A liquid non-metal is ..... (Br_2, I_2)

MULTIPLE CHOICE QUESTIONS

Select the correct answer from the choices A, B, C, D which are given. Write only the letter corresponding to the correct answer.

1. Air is

A. a compound **B.** an element **C.** a mixture **D.** none of these.

2. An example of homogeneous mixture is

A. graphite and charcoal **B.** calcium carbonate and calcium bicarbonate

C. starch and sugar **D.** alcohol and water

3. Which of the following is not an element ?

A. Diamond **B.** Graphite **C.** Ozone **D.** Sand

4. Which of the following is an element ?

A. Silica **B.** Glass **C.** Magnesia **D.** Graphite

5. Which of the following is not a compound ?

A. Marble **B.** Common salt **C.** Brass **D.** Sugar.

6. The element which is a liquid at slightly above 30°C is

A. Calcium **B.** Lithium **C.** Caesium **D.** Sodium

7. Two liquids can be separated using a separating funnel if

A. two liquids have appreciably different boiling points

B. one of the liquids is water

C. two liquids are miscible with each other

D. two liquids are immiscible with each other.

4 CHAPTER THE LANGUAGE OF CHEMISTRY

Q. 1. (*a*) What is a symbol ?

.....

.....

(*b*) What qualitative and quantitative information is conveyed by the symbol 'N' ?

Qualitative : .....

.....

.....

Quantitative :.....

.....

.....

.....

(*c*) Give the difference between a symbol and an abbreviation.

.....

.....

.....

.....

(*d*) Give the symbols of the following elements.

(*i*) Oxygen : .....

(*ii*) Arsenic : .....

(*iii*) Manganese : .....

(*iv*) Tin : .....

(*v*) Nickel : .....

Q. 2. (*a*) What do you understand by the term "Valency" ?

.....

.....

.....

(*b*) What do you understand by the term "Variable valency" ? Give an example.

.....

.....

.....

Q. 3. Explain the following terms, giving suitable examples wherever possible.

(*a*) Cation : .....

.....

(*b*) Anion : .....

.....

(*c*) Simple radical : .....

.....

(*d*) Compound radical : .....

Q. 4. Write the symbols of the following radicals.

(*a*) Hydrogen : .....

(*b*) Ammonium : .....

(*c*) Stannous : .....

(*d*) Plumbic : .....

(*e*) Chromium : .....

(*f*) Oxide : .....

(*g*) Cyanide : .....

(*h*) Ferricyanide : .....

(*i*) Phosphate : .....

(*j*) Carbide : .....

Q. 5. (*a*) What do you understand by the term "Chemical" formula ? Give examples:

.....

.....

.....

(*b*) Give the significance of a chemical formula.

.....

.....

.....

.....

(*c*) What are the limitations of a chemical formula ?

.....

.....

.....

.....

.....

.....

.....

(*d*) What information does the formula "$CaCO_3$" give to a chemist ?

.....

.....

.....

.....

.....

Q. 6. Write the names of the following compounds.

(*i*) $KClO_3$: .....

(*ii*) $CuSO_4$: .....

(*iii*) KOH : .....

(*iv*) HClO : .....

(*v*) $KMnO_4$: .....

(*vi*) H_2SO_3 : .....

(*vii*) HNO_3 : .....

(*viii*) H_2CO_3 : .....

(*ix*) NH_4OH : .....

(*x*) $Ca(OH)_2$: .....

(*xi*) $(NH_4)_2S$: .....

(*xii*) $Al_2(SO_4)_3$: .....

(*xiii*) $Pb(NO_3)_2$: .....

(*xiv*) $Mg(HCO_3)_2$: .....

(*xv*) Na_2PbO_2 : .....

Q. 7. Write the formulae of the following :

(*i*) Hydrochloric acid : .....

(*ii*) Silver chloride : .....

(*iii*) Potassium dichromate : .....

(*iv*) Sulphuric acid : .....

(*v*) Barium chloride : .....

(*vi*) Sodium nitrate : .....

(*vii*) Aluminium hydroxide : .....

(*viii*) Magnesium sulphate : .....

(*ix*) Ammonium chloride : .....

(*x*) Lead dioxide : .....

(*xi*) Magnesium nitride : .....

(*xii*) Potassium zincate : .....

(*xiii*) Calcium bicarbonate : .....

(*xiv*) Zinc carbonate : .....

(*xv*) Lead hydroxide : .....

Q. 8. (*a*) What do you understand by trivial name of a compound ?

.....

.....

(*b*) Give chemical names of three compounds and also their trivial names.

(*i*) ....

(*ii*) ....

(*iii*) ....

Q. 9. (*a*) What do you understand by the term "Chemical equation" ?

.....

.....

(*b*) Why should a chemical equation be always balanced ?

.....

.....

(*c*) What are the limitations of chemical equation ? .....

.....

.....

.....

Q. 10. Balance the following equations :

(*i*) $Al + H_2SO_4 \rightarrow Al_2(SO_4)_3 + H_2$

.....

(*ii*) $NH_4OH + CuSO_4 \rightarrow (NH_4)_2SO_4 + Cu(OH)_2$

.....

(*iii*) $ZnSO_4 + Al \rightarrow Al_2(SO_4)_3 + Zn$

.....

(*iv*) $Ca(NO_3)_2 \rightarrow CaO + NO_2 + O_2$

.....

(*v*) $KMnO_4 \xrightarrow{\Delta} K_2MnO_4 + MnO_2 + O_2$

.....

(*vi*) $K_2Cr_2O_7 \xrightarrow{\Delta} K_2CrO_4 + Cr_2O_3 + O_2$

.....

(*vii*) $Pb_3O_4 \rightarrow PbO + O_2$

.....

(*viii*) $Mg(HCO_3)_2 + CaCO_3 \rightarrow MgCO_3 + CaCO_3 + H_2O$

.....

(*ix*) $Hg(NO_3)_2 \xrightarrow{\Delta} Hg + NO_2 + O_2$

.....

(*x*) $ZnCO_3 + HCl \rightarrow ZnCl_2 + H_2O + CO_2$

.....

Q. 11. Write the formula and balance the following equations :

(*i*) Ammonium chloride + Calcium hydroxide → Calcium chloride + Ammonia + Water.

.....

(*ii*) Zinc oxide + Nitric acid → Zinc nitrate + Water.

.....

(*iii*) Lead dioxide + Hydrochloric acid → Lead chloride + Water + Chlorine.

.....

(*iv*) Iron + Conc. sulphuric acid → Iron (II) sulphate + Sulphur dioxide gas + Water.

.....

(*v*) Calcium + Water → Calcium hydroxide + Hydrogen

.....

(*vi*) Red lead → Lead monoxide + Oxygen

.....

(*vii*) Zinc + dil. Sulphuric acid → Zinc sulphate + Hydrogen

.....

(*viii*) Aluminium oxide + Sulphuric acid → Aluminium sulphate + Water

.....

(*ix*) Ferrous sulphate + Sodium hydroxide → Ferrous hydroxide + Sodium sulphate

.....

(*x*) Calcium carbonate + Hydrochloric acid → Calcium chloride + Water + Carbon dioxide.

.....

Q. 12. Complete the following equations in words and then write down the balanced molecular equation in each case :

(*i*) Magnesium + dil. hydrochloric acid

.....

(*ii*) Lead monoxide + nitric acid

.....

(*iii*) Ammonium sulphate + calcium hydroxide

.....

(*iv*) Zinc nitrate + sodium carbonate

.....

(*v*) Copper + conc. sulphuric acid

.....

(*vi*) Iron (II) sulphate + Sodium hydroxide

.....

(*vii*) Zinc + hydrochloric acid

.....

(*viii*) Calcium + water

.....

(*ix*) Sodium nitrate + conc. sulphuric acid

.....

(*x*) Aluminium hydroxide + sulphuric acid

.....

Q. 13. (*a*) XOH is the formula of hydroxide of metal X. What is the formula of its chloride and sulphate ?

.....

.....

(*b*) YSO_4 is the sulphate of metal Y. Write the formula of its hydroxide and chloride.

.....

.....

(*c*) What do the following symbols denote ?

(*i*) 2H .....

(*ii*) H_2 .....

(*iii*) H^+ .....

Q. 14. An element has a valency of +3

(*i*) What will be the formula of its chloride ? .....

(*ii*) What will be formula of its sulphide ? .....

(*iii*) What will be the formula of its nitride ? .....

(*iv*) What will be the formula of its carbonate ? .....

(*v*) What will be formula of its bisulphite ? .....

Q. 15. A newly discovered element has a valency of two. Taking the symbol as M, give the formula of its.

(*i*) Carbide : ..... (*ii*) Acetate : .....

(*iii*) Sulphide : ..... (*iv*) Phosphate : .....

(*v*) Nitrate : ..... (*vi*) Nitrite : .....

Q. 16. Fill in the blanks :

(*i*) A chemical equation is ..... .

(*ii*) An atomic equation is ..... .

(*iii*) A skelton equation is ..... .

(*iv*) A chemical equation expresses a chemical reaction with its (*a*) ..... and ..... in (*b*) ..... and ..... .

(*v*) In a chemical equation, the reactants are on the ..... hand side.

(*vi*) The equation must be ..... in the final form.

(*vii*) A chemical equation expresses a ..... which actually occurs.

(*viii*) The symbol and formula of all substances are same which exist in the ..... state.

(*ix*) Equations in which the elementary substances are written in the atomic form are called ..... equations.

(*x*) Equations which contain an equal number of atoms of each element on the two sides of the arrow head are called ..... equations.

(*xi*) Equations which represent only the various reactants and products of a chemical reaction are called ..... equations.

(*xii*) Equations in which all products and reactants are in molecular form are called ..... equations.

Q. 17. (*a*) Why certain elements exhibit variable valency ?

.....

.....

(*b*) Giving at least two examples explain how the ions of the elements having variable valency are named.

.....

.....

Q. 18. Balance the following equations by partial equation method :

(*i*) $PbS + H_2O_2 \longrightarrow PbSO_4 + H_2O$

(*ii*) $KI + O_3 + H_2O \longrightarrow KOH + I_2 + O_2$

(*iii*) $O_3 + HI \longrightarrow I_2 + H_2O + O_2$

(*iv*) $FeSO_4 + H_2O_2 + H_2SO_4 \longrightarrow Fe_2(SO_4)_3 + H_2O$

(*v*) $KMnO_4 + FeSO_4 + H_2SO_4 \longrightarrow K_2SO_4 + MnSO_4 + Fe_2(SO_4)_3 + H_2O$

(*vi*) $HNO_3 + H_2S \longrightarrow NO + H_2O + S$

(*vii*) $KMnO_4 + H_2SO_4 + H_2C_2O_4 \longrightarrow K_2SO_4 + MnSO_4 + H_2O + CO_2$

(*viii*) $K_2Cr_2O_7 + H_2SO_4 + SO_2 \longrightarrow K_2SO_4 + Cr_2(SO_4)_3 + H_2O$

(*ix*) $I_2 + HNO_3 \longrightarrow NO_2 + HIO_3 + H_2O$

(*x*) $Cu + H_2SO_4 \longrightarrow CuSO_4 + SO_2 + H_2O$

(*xi*) $C + H_2SO_4 \longrightarrow CO_2 + H_2O + SO_2$

(*xii*) $Cl_2 + \underset{(hot)}{NaOH} \longrightarrow NaClO_3 + NaCl + H_2O$

(*xiii*) $KMnO_4 + H_2SO_4 + H_2S \longrightarrow K_2SO_4 + MnSO_4 + H_2O + S$

(*xiv*) $Mg + HNO_3 \longrightarrow Mg(NO_3)_2 + NH_4NO_3 + H_2O$

(*xv*) $CuSO_4 + KI \longrightarrow K_2SO_4 + Cu_2I_2 + I_2$

(*xvi*) $P_4 + O_3 + H_2O \longrightarrow H_3PO_4 + O_2$

(*xvii*) $NaNO_2 + O_3 \longrightarrow NaNO_3 + O_2$

(*xviii*) $HCl + O_3 \longrightarrow H_2O + O_2 + Cl_2$

(*xix*) $I_2 + O_3 + H_2O \longrightarrow HIO_3 + O_2$

(*xx*) $K_2MnO_4 + O_3 + H_2O \longrightarrow KMnO_4 + KOH + O_2$

5
CHAPTER

PHYSICAL AND CHEMICAL CHANGES

Q. 1. (*a*) Define physical change.

.....

.....

(*b*) Give four examples of a physical change.

....

....

(*c*) State four characteristics of a physical change.

.....

.....

Q. 2. (*a*) Define chemical change.

.....

.....

.....

(*b*) Give four examples of a chemical change.

....

....

(*c*) State four characteristics of a chemical change.

.....

.....

.....

Q. 3. State four main points of differences between a physical change and chemical change.

Physical change	Chemical change
1.	1. .....
2.	2. .....
3.	3. .....
4.	4. .....

Q. 4. Name the four main types of chemical reactions giving one example of each case :

(*i*) ....

(*ii*) ....

(*iii*) ....

(*iv*) ....

Q. 5. Define the terms listed below :

(*a*) Endothermic reaction :

.....

.....

(*b*) Exothermic reaction :

.....

.....

(*c*) Synthesis reaction :

.....

.....

(*d*) Reversible reaction :

.....

.....

(*e*) Simple displacement :

.....

.....

(*f*) Double decomposition :

.....

.....

Q. 6. State whether the following changes are physical or chemical changes. Give one reason for your answer.

(*a*) When carbon dioxide is passed into clear lime water, a white turbidity is formed :

Kind of change : .....

Reason : .....

.....

(*b*) Sugar dissolves in water :

Kind of change : .....

Reason : .....

.....

(*c*) Violet vapour fill the whole tube when a few crystals of iodine are heated in a dry test tube :

Kind of change : .....

Reason : .....

.....

(*d*) Milk sours in hot and humid climate :

Kind of change : .....

Reason : .....

.....

(*e*) A beaker contains some dilute sulphuric acid, a piece of granulated zinc is dropped into it and stirred. The piece disappears after some time :

Kind of change : .....

Reason : .....

.....

(*f*) Anhydrous copper sulphate (white in colour), turns blue, when a drop of water is poured over it :

Kind of change : .....

Reason : .....

.....

(*g*) A glass tube softens when heated :

Kind of change : .....

Reason : .....

.....

(*h*) Sugar in the form of thick syrup is taken in a test tube. Conc. sulphuric acid is added to it. A blackish mass is formed :

Kind of change : .....

Reason : .....

.....

(*i*) White zinc oxide powder is heated in a dry test tube :

Kind of change : .....

Reason : .....

(*j*) A rock rolls down a hill slope :

Kind of change : .....

Reason : .....

(*k*) A frog breathes heavily :

Kind of change : .....

Reason : .....

(*l*) Action of hydrochloric acid on zinc :

Kind of change : .....

Reason : .....

Q. 7. Classify the following changes as physical or chemical :

(*a*) Digestion of food. .....

(*b*) Drying of wet paint. .....

(*c*) Formation of dew. .....

(*d*) Liquefaction of air. .....

(*e*) The lighting of an electric lamp. .....

(*f*) Crystallisation of sugar from its saturated solution. .....

(*g*) Electrolysis of acidified water. .....

(*h*) Growth of a tree. .....

(*i*) Smoking of cigarette. .....

(*j*) Dissolution of sulphur in carbon disulphide. .....

(*k*) Blue crystals of copper sulphate are formed on cooling a conc. solution of copper sulphate. .....

(*l*) Ringing of an electric bell. .....

(*m*) Conversion of milk into curd. .....

(*n*) Separating cream from milk. .....

(*o*) Ripening of fruit. .....

(*p*) Charging a car battery. .....

(*q*) Breaking of a glass pane. .....

(*r*) Formation of dry ice. .....

(*s*) Magnetising a piece of iron. .....

(*t*) Melting of a piece of ice in a test tube. .....

(*u*) A platinum wire is heated. .....

(*v*) Manufacture of salt from sea water. .....

(*w*) Production of bio-gas. .....

(*x*) Evaporation of water. .....

(*y*) Burning of petrol. .....

(*z*) Plucking of fruit. .....

Q. 8. A person eats chocolate and digests it. In doing so here takes place a physical and chemical change identify the changes and give reason for your answer.

.....

.....

.....

Q. 9. Classify the following as a physical or a chemical change. State a reason for the choice.

(*a*) Rusting of iron : .....

.....

(*b*) Butter going rancid : .....

.....

(*c*) Making of wine : .....

.....

(*d*) Clotting of blood : .....

.....

(*e*) Burning of cooking gas : .....

.....

(*f*) Baking of cake : .....

.....

(*g*) Glow of a tube light : .....

.....

(*h*) Dissolving salt in water : .....

.....

Q. 10. Read the following description of mercury and list its physical and chemical properties in the table given below.

Mercury is a silvery white shining metal. It is the only metal which is liquid at ordinary temperature. Its specific gravity is 13.59 at 0°C. It is a good conductor of heat and electricity. It is not attacked by water, alkalis and air (at ordinary temperature). It combines with sulphur when rubbed with it in a mortar. It dissolves in conc. nitric acid.

Physical Properties	**Chemical Properties**
(*i*)	(*i*) .....
(*ii*)	(*ii*) .....
(*iii*)	(*iii*) .....
(*iv*)	(*iv*) .....
(*v*)	(*v*) .....

Q. 11. Give the main conditions necessary for a chemical reaction to occur.

Q. 12. State what you would observe and name the product formed when

(*a*) Sodium nitrate is heated strongly in a dry glass test tube.

Observation : .....

.....

Product (s) : .....

(*b*) Zinc carbonate is heated in a glass test tube and the residue formed is allowed to cool.

Observation : .....

.....

Product (s) : .....

(*c*) Iodine is heated in a dry test tube.

Observation : .....

.....

Product (s) : .....

(*d*) Sugar crystals are heated strongly in a test tube.

Observations : .....

.....

Product (s) : .....

(*e*) Iron nails left exposed to moist air for a few days.

Observation : .....

.....

Product (s) : .....

Q. 13. State the effect of exothermic and endothermic reactions on the surroundings. Also give an example of such reactions.

Effect of endothermic reaction :

.....

.....

.....

Effect of exothermic reaction :

.....

.....

.....

Q. 14. Give an example of a physical change that is reversible and one example of a chemical change that is reversible.

.....

.....

Q. 15. (*i*) Give balanced equations to illustrate four chemical reactions that proceed in the presence of light.

(*a*) .....

(*b*) .....

(*c*) .....

(*d*) .....

(*ii*) Give balanced equations wherever possible, or, when this is not possible, explain the following by means of examples.

(*a*) A reaction which is brought about by an electric current.

.....

(*b*) A reaction liberating heat energy.

.....

(*c*) A reaction with a solid and a gas, which produces heat and light.

.....

Q. 16. State two ways by which a lump of sugar can be made to dissolve rapidly in a tumbler half filled with water.

(*a*) .....

(*b*) .....

Q. 17. Study the equation below and answer the following questions.

$$N_2 + O_2 \xrightarrow{3000°C} 2NO$$

(*a*) Name the elements taking part in the reaction.

.....

(*b*) State the number of each atom taking part in the reaction.

.....

(*c*) Under what condition is the reaction occuring ?

.....

(*d*) State the type of energy change taking place in this reaction.

.....

(*e*) State the information that is not conveyed by the reaction.

.....

Q. 18. Enlist four ways by which rate of a chemical reaction can be increased.

(*a*) .....

(*b*) .....

(*c*) .....

(*d*) .....

Q. 19. Complete and balance the following equations and also state the type of reaction that is taking place :

(*a*) $CuCO_3 \xrightarrow{\Delta}$ (*b*) $Mg + H_2SO_4 \longrightarrow$

(*c*) $KBr + Cl_2 \longrightarrow$ (*d*) $Sb + Cl_2 \xrightarrow{\Delta}$

(*e*) $Fe + Cl_2 \xrightarrow{\Delta}$ (*f*) $Pb(NO_3)_2 \xrightarrow{\Delta}$

(*g*) $SO_2 + O_2 \xrightarrow{450°C/Pt}$ (*h*) $FeCl_2 + Zn \xrightarrow{\Delta}$

(*i*) $H_2O \xrightarrow[\text{current}]{\text{electric}}$ (*j*) $Mg + N_2 \xrightarrow{\Delta}$

(*k*) $Fe + S \xrightarrow{\Delta}$ (*l*) $Pb(NO_3)_2 + NaCl \longrightarrow$

(*m*) $Mg(OH)_2 + HCl$ (*n*) $P_2O_5 + H_2O \longrightarrow$

(*o*) $NaOH + HNO_3 \longrightarrow$ (*p*) $Zn + CuSO_4 \longrightarrow$

(*q*) $CaO + H_2O \longrightarrow$ (*r*) $BaCl_2 + H_2SO_4 \longrightarrow$

(*s*) $KOH + H_2SO_4 \longrightarrow$ (*t*) $CuSO_4 + NaOH \longrightarrow$

(*u*) $P_4 + O_2 \longrightarrow$ (*v*) $KI + Cl_2 \longrightarrow$

(*w*) $CuO + HCl \longrightarrow$ (*x*) $K + H_2O \longrightarrow$

Q. 20. Give balanced equations for the action of heat on the following compounds.

(*a*) Silver oxide : .....

(*b*) Sodium nitrate : .....

(*c*) Magnesium carbonate : .....

(*d*) Magnesium hydroxide : .....

(*e*) Iron (II) hydroxide : .....

(*f*) Zinc carbonate : .....

(*g*) Potassium chlorate : .....

(*h*) Red lead : .....

(*i*) Potassium nitrate : .....

(*j*) Lead (IV) oxide : .....

(*k*) Washing soda : .....

(*l*) Ammonium chloride : .....

(*m*) Silver nitrate : .....

(*n*) Mercury (II) oxide : .....

(*o*) Copper (II) nitrate : .....

(*p*) Lead nitrate : .....

(*q*) Copper carbonate : .....

(*r*) Lead (II) oxide : .....

(*s*) Ammonium nitrate : .....

Q. 21. Give balanced equations to prepare potassium chloride using each of the method given below :

(*a*) Synthesis : .....

(*b*) Decomposition : .....

(*c*) Simple displacement : .....

(*d*) Neutralisation : .....

Q. 22. Give balanced equations to carry out the following conversions.

(*a*) Iron ⟶ Iron (II) hydroxide

.....

.....

(*b*) Iron ⟶ Iron (III) hydroxide

.....

.....

(*c*) Zinc nitrate ⟶ Zinc

.....

.....

(*d*) Sulphur ⟶ Sulphuric acid

.....

.....

(*e*) Nitrogen ⟶ Ammonium hydroxide

.....

.....

(*f*) Copper (II) ⟶ Copper sulphate

.....

.....

.....

(*g*) Silver nitrate ⟶ Silver sulphide

.....

.....

(*h*) Calcium ⟶ Calcium hydroxide

.....

.....

Q. 23. Write correctly balanced equations in the following case :

(*a*) When phosphorus is burnt in a jar of oxygen.

.....

(*b*) When potassium chlorate is strongly heated in a hard glass test tube.

.....

(*c*) When carbon dioxide is passed over red hot coke.

.....

(*d*) When steam is passed over red hot iron.

.....

Q. 24. What type of reactions are represented by the following equations.

(*a*) $N_2 + 3H_2 \longrightarrow 2NH_3\ (g)$: .....

(*b*) $CaCO_{3(s)} \xrightarrow{\Delta} CaO_{(s)} + CO_2\ (g)$: .....

(*c*) $2HClO_{(aq)} \xrightarrow[\mu v \text{ radiation}]{\text{Sunlight}} 2HCl_{(aq)} + O_2(g)$: .....

(*d*) $2H_2O_{(l)} \xrightarrow[\text{current}]{\text{electric}} 2H_{2(g)} + O_2(g)$: .....

(*e*) $2HgO \xrightarrow{\text{heat}} 2Hg_{(l)} + O_{2(g)}$: .....

(*f*) $Fe_{(s)} + CuSO_{4(aq)} \longrightarrow Cu_{(s)} + FeSO_{4(aq)}$: .....

(*g*) $NaCl(aq) + AgNO_{3(aq)} \longrightarrow AgCl_{(s)} + NaNO_{3(aq)}$: .....

(*h*) $2H_2 + O_{2(g)} \longrightarrow 2H_2O + 136.00$ kcal : .....

(*i*) $C_{(s)} + 2S_{(s)} \longrightarrow CS_{2(l)} - 22$ kcal : .....

(*j*) $6CO_2 + 12H_2O \xrightarrow[\text{Sunlight}]{\text{Chlorophyll}} C_6H_{12}O_6 + 6H_2O + 6O_2$: .....

(*k*) $C_{(s)} + O_{2(g)} \longrightarrow CO_{2(g)} + \text{Heat}$: .....

(*l*) $NaCl \xrightarrow{\text{electric current}} Na^+ + Cl^-$: .....

(Molten or fused)

(*m*) $2NH_4OH_{(aq)} + CuSO_{4(aq)} \longrightarrow (NH_4)_2SO_4 + Cu(OH)_2$: .....

(*n*) $Zn_{(s)} + CuSO_4(aq) \longrightarrow ZnSO_{4(aq)} + Cu_{(s)}$: .....

(*o*) $2Al_2O_{3(l)} \xrightarrow[\text{current}]{\text{electric}} 4Al_{(s)} + 3O_{2(g)}$: .....

Q. 25. By using Iron metal only, how will you prepare

(*i*) Iron (II) Sulphide : .....

(*ii*) Iron (II) Sulphate : .....

(*iii*) Iron (III) Chloride : .....

(*iv*) Iron (II) Chloride : .....

(*v*) Ferresoferric oxide ? : .....

Q. 26. Define the following terms :

(*i*) Displacement reaction : .....

.....

(*ii*) Neutralisation reaction : .....

.....

(*iii*) Reversible reaction : .....

.....

(*iv*) Photochemical reaction : .....

.....

(*v*) Thermal dissociation : .....

.....

(*vi*) Reactants : .....

(*vii*) Products : .....

(*viii*) Catalytic reactions : .....

(*ix*) Oxidation : .....

(*x*) Oxidising agent : .....

(*xi*) Reduction : .....

(*xii*) Reducing agent : .....

(*xiii*) Redox reaction : .....

Q. 27. Name conditions for a chemical reaction. Support your answer by at least one example each.

.....

.....

.....

Q. 28. By giving at least one reason whether the changes listed below are physical or chemical.

(*a*) Blackening of silver ware :

Kind of change : .....

Reason : .....

.....

(*b*) Adding concentrated sulphuric acid to water :

Kind of change : .....

Reason : .....

.....

(*c*) Pouring drops of water over quicklime :

Kind of change : .....

Reason : .....

.....

(*d*) Bursting of crackers :

Kind of change : .....

Reason : .....

.....

(*e*) Sublimation of ammonium chloride :

Kind of change : .....

Reason : .....

.....

(*f*) Discharging of a car battery :

Kind of change : .....

Reason : .....

.....

Q. 29. By giving two examples each differentiate between thermal decomposition and thermal dissociation.

(*a*) Thermal decomposition : .....

.....

Examples :

(*i*) .....

(*ii*) .....

(*b*) Thermal dissociation : .....

.....

Examples :

(*i*) .....

(*ii*) .....

Q. 30. What is the difference between dissolution of NaCl in water and dissolution of sodium metal in water ?

.....

.....

.....

.....

.....

Q. 31. On heating strongly, ammonium chloride decomposes to form ammonia gas and hydrochloric acid. However, the change is regarded as physical. On the other hand, when ammonium

nitrate is heated, it decomposes to form nitrous oxide gas and steam, but the change is regarded as chemical. Explain the above statements.

.....

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Q. 32. Give two examples in which a physical and a chemical change takes place simultaneously.

Example 1. .....

.....

.....

Example 2. .....

.....

.....

Q. 33. Classify the following reactions as :

(*i*) Chemical combination or synthesis

(*ii*) Chemical decomposition reaction

(*iii*) Double decomposition reaction

(*iv*) Displacement or substitution reaction

(*v*) Neutralisation reaction

(*vi*) Reversible reaction

(*vii*) Photochemical reaction

(*viii*) Isomerisation or rearrangement reaction.

(*a*) $H_2 + I_2 \rightleftharpoons 2HI$

.....

(*b*) $2AgBr \xrightarrow{\text{sunlight}} 2Ag + Br_2$

.....

(*c*) $NH_4CNO \longrightarrow NH_2CONH_2$

.....

(*d*) $Mg + ZnCl_2 \longrightarrow MgCl_2 + Zn$

.....

(*e*) $S + O_2 \longrightarrow SO_2$

.....

(*f*) $2KNO_3 \xrightarrow{\Delta} 2KNO_2 + O_2$

.....

(*g*) $NaOH + HCl \longrightarrow NaCl + H_2O$

.....

(*h*) $BaCl_2 + Na_2SO_4 \longrightarrow BaSO_4 + 2NaCl$

.....

Q. 34. Define the following terms and give one example of each.

(*i*) Positive catalysts : .....

Example : .....

(*ii*) Negative catalysts : .....

Example : .....

(*iii*) Promoters : .....

Example : .....

(*iv*) Inhibitors : .....

Example : .....

Q. 35. Define the following terms.

(*a*) Spontaneous combustion : .....

.....

.....

(*b*) Respiration : .....

.....

.....

(*c*) Inspired air : .....

.....

(*d*) Respired air : .....

.....

(*e*) Combustion or burning : .....

.....

.....

(*f*) Combustible substances : .....

.....

.....

(*g*) Non–combustible substances : .....

.....

.....

(*h*) Inflammable substances : .....

.....

.....

(*i*) Supporter of combustion : .....

.....

.....

(*j*) Ignition temperature : .....

.....

.....

Q. 36. The apparatus is used to determine fraction of air used up in burning. Answer the following questions when the cork is removed and the solid (W) is touched with red hot iron rod.

(*i*) Name the solid (W) : .....

(*ii*) What would you observe when red hot rod is introduced in the bell jar ?

.....

.....

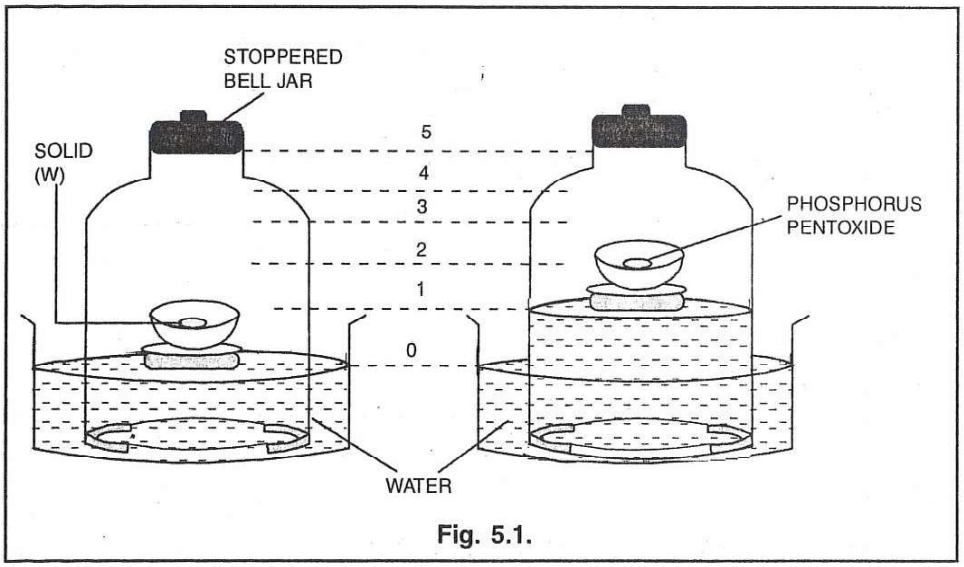

Fig. 5.1.

(*iii*) What is your observation when the apparatus is allowed to cool ?

.....

(*iv*) (*a*) How many parts of air by volume help in burning ?

.....

(*b*) Name the solid (A) : .....

(*c*) Name the solid (B) : .....

(*d*) Name the solid (C) : .....

(*e*) What is the function of solid (A) ?

.....

(*f*) Name the gas D : .....

(*g*) Why does the weight of the tube increases as the candle burns ?

.....

(*h*) What is the function of solid (B) ?

.....

(*i*) Mention the use of (C) :

.....

(*j*) What is the conclusion of above experiment ?

.....

Q. 42. Anhydrous copper sulphate is greenish white solid. When exposed to air, the solid changes to a blue solid. What do you conclude from the observation ? What will happen when the blue solid is heated ? What is the name of the blue substance ?

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.....

.....

.....

Q. 43. Give reasons for the following :

(*i*) The proportion of nitrogen in both respired air and inspired air is the same.

.....

.....

(*ii*) Gunpowder (a finely powdered mixture of potassium nitrate, carbon and sulphur) burns without air when heated strongly enough.

.....

.....

(*iii*) Oxygen is necessary for burning. However, Magnesium continues to burn in a jar containing carbon dioxide.

.....

.....

Q. 44. When burnt in air, magnesium gains in weight but coal loses weight. Explain these observations.

.....

.....

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.....

.....

Q. 45. Give two examples for each of the following type of gases :

(*i*) Non-combustible, but supports combustion : .....

(*ii*) Combustible, but does not support combustion : .....

(*iii*) Non-combustible and a non-supporter of combustion : .....

Q. 46. How the composition of oxygen and carbon dioxide remains constant in air?

.....

.....

Q. 47. (*a*) What is gun powder ?

.....

(*b*) Name two other compounds which can be substituted for nitre in the gun powder.

(*i*) .....

(*ii*) .....

(*c*) Why does the gun powder catches fire in the absence of air ?

.....

.....

.....

(*d*) Name the gases produced due to the explosion of gun powder and give the chemical equations.

.....

.....

.....

Q. 48. Give two similarities and four differences between respiration and combustion.

Combustion	Respiration
Similarities	
1.	1. .....
2.	2. .....
Differences	
1.	1. .....
2.	2. .....
3.	3. .....
4.	4. .....

Q. 49. Fill in the blanks :

(*i*) When a piece of calcium is dropped in water, it becomes cloudy due to the formation of .....

(*ii*) Dissolution of sugar in water is a ..... change while burning of paper is a ..... change.

(*iii*) When zinc carbonate is heated, the colour of the residue is ..... which becomes ..... on cooling.

(*iv*) ..... gas is evolved on heating lead nitrate and ..... gas is evolved on heating sodium nitrate.

(*v*) Respiration is a ..... change.

MULTIPLE CHOICE QUESTIONS

Select the correct answer from the choices A, B, C, D which are given. Write only the letter corresponding to the correct answer.

1. Which of the following processes results in the formation of a new chemical compound ?
   A. Dissolving common salt in water. **B.** Heating water.
   C. Heating platinum rod. **D.** Heating iron rod.
2. Which of the following processes is a physical change ?
   A. Sodium dissolves in water **B.** Iron rusts
   C. Iron is magnetised **D.** Magnesium wire is burnt.
3. A method of obtaining oxygen which illustrates a physical change and does not involve a chemical change is
   A. electrolysis of water **B.** heating of red lead
   C. distilling of liquid air **D.** heating potassium chlorate.
4. Chemical reaction takes place in all the cases except when
   A. kerosene is added to petrol **B.** iron is kept in moist air
   C. sodium is put in water. **D.** Decomposition of H_2O_2.
5. Lead nitrate on heating gives lead oxide, nitrogen dioxide and oxygen. The reaction is known as
   A. combustion **B.** combination **C.** displacement **D.** decomposition.
6. Rusting of iron is a chemical reaction. The reaction is
   A. analysis **B.** displacement **C.** combination **D.** double decomposition.
7. Change of hydrogen into hydrogen ions is
   A. oxidation **B.** acid base reaction
   C. reduction of hydrogen **D.** displacement reaction.
8. One of the phenomena, which can't be described as combustion is
   A. oxidation of coal in air **B.** burning of magnesium in nitrogen
   C. reaction of antimony in chlorine **D.** lighting of an electric bulb.

6 CHAPTER

WATER

Q. 1. Name five sources of water :

(*a*) .....

(*b*) .....

(*c*) .....

(*d*) .....

(*e*) .....

Q. 2. Name the scientist who first prepared water. How did he obtain water ?

.....

.....

Q. 3. Is water an element or a compound ? Give reason for your answer.

.....

.....

Q. 4. Give five important physical properties of water.

.....

.....

Q. 5. (*a*) Why is rain water called purest kind of naturally occuring water ?

.....

.....

(*b*) Why the first shower of rain water is not considered to be pure ?

.....

(*c*) Why is water called universal solvent ?

.....

Q. 6. How will you prove experimentally that tap water containss dissolved impurities ? Draw the diagram of the apparatus used.

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Q. 7. Explain the effect of temperature and pressure on solubility of gases in water.

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Q. 8. Explain the following :

(*i*) A soda water bottle fizzes on opening the seal.

.....

.....

(*ii*) A chilled soda water bottle does not produce large effervescence on opening as compared to another soda water bottle at room temperature.

.....

.....

(*iii*) Boiled water has a flat taste.

.....

.....

(*iv*) Water is used as coolant in car radiators.

.....

.....

(*v*) Lakes and rivers donot freeze suddenly.

.....

.....

(*vi*) Steam causes more serious burns than water at 100°C.

.....

.....

Q. 9. Give balanced equation for the action of water on the following.

(*i*) Sodium oxide : .....

(*ii*) Sodium metal : .....

(*iii*) Red hot iron : .....

(*iv*) Phosphorus pentoxide : .....

(*v*) Carbon dioxide : .....

(*vi*) Nitrogen dioxide : .....

(*vii*) Magnesium Nitride : .....

(*viii*) Sodium peroxide : .....

(*ix*) Sulphur trioxide : .....

(*x*) Magnesium : .....

(*xi*) Aluminum : .....

(*xii*) Carbon : .....

Q. 10. (*a*) Explain the biological importance of gases dissolved in water.

.....

.....

(*b*) Explain the importance of oxygen and carbon dioxide dissolved in water.

.....

.....

.....

.....

Q. 11. (*i*) Name a salt whose solubility increases with the rise in temperature.

.....

(*ii*) Name one salt whose solubility does not change with rise of temperature.

.....

(*iii*) Name a salt whose solubility decreases with rise in temperatures.

.....

(*iv*) Name one salt whose solubility first increases and then decreases with the rise in temperature.

.....

Q. 12. Sodium chloride, concentrated sulphuric acid and sodium carbonate are exposed to air. Select one substance from the option given in which there is

(*i*) decrease in weight : .....

(*ii*) increase in weight : .....

(*iii*) no change in weight : .....

Q. 13. (*i*) Explain why table salt becomes moist and sticky during rainy season.

.....

.....

(*ii*) Why do the crystals of washing soda get coated with a white powder when exposed to air ?

Q. 14. Mention the condition under which the reaction between red hot iron and steam is reversible:

.....

Q. 15. Name the following :

(1) Metal which reacts vigorously with cold water to displace hydrogen :

.....

(2) Metal which reacts with hot water to displace hydrogen : .....

(3) Metal which reacts with steam when heated strongly : .....

(4) Metal which reacts with superheated steam reversibly : .....

(5) Metal which reacts with steam only when white hot : .....

(6) Metals which neither react with water nor with steam : .....

Q. 16. Why is temperature always mentioned with a saturated solution of a solid in a liquid ?

.....

Q. 17. Define the following terms :

1. Solute : .....
2. Solvent : .....
3. Saturated solution : .....
4. Unsaturated solution : .....
5. Supersaturated solution : .....
6. Solubility : .....
7. Crystals : .....
8. Amorphous solid : .....
9. Water of crystallisation : .....
10. Hydrated substances : .....
11. Anhydrous salt : .....
12. Solubility curves : .....

Q. 18. (*a*) Explain the effect of heat on blue crystals of copper sulphate.

.....

(*b*) What is the conclusion of the above experiment ?

.....

(*c*) Mention the colour of :

(*i*) Hydrated copper sulphate : .....

(*ii*) Anhydrous copper sulphate : .....

Q. 19. Name the suitable solvents for the following substances.

	Substance	**Solvent**
(*i*)	Phosphorus :	.....
(*ii*)	Sulphur :	.....
(*iii*)	Rust :	.....
(*iv*)	Resins :	.....
(*v*)	Paints :	.....
(*vi*)	Iodine :	.....
(*vii*)	Wax :	.....
(*viii*)	Chlorophyll :	.....
(*ix*)	Table salt :	.....
(*x*)	Nail polish :	.....
(*xi*)	Nitre :	.....
(*xii*)	Grease :	.....
(*xiii*)	Oil :	.....
(*xiv*)	Shellac :	.....
(*xv*)	Sugar :	.....
(*xvi*)	Silver chloride :	.....

Q. 20. Name two naturally occurring forms of water in solid state :

.....

Q. 21. Name two naturally occurring forms of water in gaseous state :

.....

Q. 22. State the importance of dissolved salts in water :

.....

.....

Q. 23. Give reasons for the following :

(*i*) Percentage of oxygen dissolved in water is greater than the percentage of oxygen in ordinary air.

.....

.....

(*ii*) Fish and water plants can survive in river water, but not in stoppered bottle of distilled water :

.....

.....

(*iii*) Hot saturated solution of potassium nitrate forms crystals on cooling.

.....

.....

(*iv*) In the manufacture of soda, carbon dioxide is not dissolved at ordinary atmospheric pressure. .....

.....

.....

(*v*) Fish in a pond remain alive even when the pond has frozen to a considerable depth.

.....

.....

(*vi*) Water is an excellent substance for use in cooling systems.

.....

.....

Q. 24. You are given a solution of a salt in water. How would you determine whether the solution is saturated or unsaturated ?

.....

.....

Q. 25. How does the presence of dissolved solids affect

(*a*) the boiling point of water : .....

(*b*) the freezing point of water : .....

Q. 26. How would you distinguish between rain water and spring water ?

.....

.....

Q. 27. Give reasons for the following :

(*i*) Solubility curves help pharmacists in preparation of drugs.

.....

.....

(*ii*) Solubility curves are used for the extraction of chemicals from their natural sources.

.....

.....

(*iii*) A hot saturated solution should be cooled slowly, followed by slow evaporation of the solution during crystallisation.

.....

.....

(*iv*) During crystallisation, solution should not be heated to dryness.

.....

.....

(*v*) The crystals deposited from a saturated solution are purer than the initial impure substance dissolved.

.....

.....

Q. 28. Complete the following statements :

(*i*) Compared to ordinary air, the air dissolved in water is richer in ..... .

(*ii*) When sodium is added to water, the resulting solution is soapy between the fingers and turns red litmus blue. This is due to the dissolved ..... produced by the reaction of sodium with water.

(*iii*) Water has maximum density at .....

(*iv*) Rain water does not contain .....

(*v*) A saturated solution can be converted to an unsaturated solution by ..... the saturated solution or by ..... to the saturated solution.

(*vi*) Cooling a hot saturated solution prepared at high temperatures results in the formation of a ..... solution.

(*vii*) Dissolved oxygen in water is used for ..... by aquatic animals.

(*viii*) The solution from which crystals have been deposited is called .....

(*ix*) Boiled water tastes flat due to the .....

Q. 29. How can you increase the solubility of a given volume of gas in water ?

.....

.....

Q. 30. Explain why silver nitrate crystals are dissolved in distilled water and not in tap water to prepare silver nitrate solution as a laboratory reagent.

.....

.....

Q. 31. Why fish caught in river cannot survive in fish tanks indoor ?

.....

.....

Q. 32. Why some fish species like Salmon cannot survive if the water temperature is above 15°C?

.....

.....

Q. 33. Fill in the blanks :

(*i*) A ..... is a substance that is dissolved in a liquid. The liquid is called a ..... When no more solid dissolves in a liquid then a .....is obtained. How soluble a substance is depends not only on what the substance is but also on the.....

(*ii*) The solubility of a gas at constant pressure may be increased by decreasing the .....

(*iii*) When calcium has reacted with water, the resulting liquid is milky in appearance. This is due to the formation of ..... which is sparingly soluble in water.

(*iv*) When the top is removed from a bottle of fizzy lemonade, bubbles of gas ..... from the liquid. This is because when pressure is released ..... carbon dioxide will dissolve and ..... gas escapes.

(*v*) The solubility of a solute is the mass of the solute (in grams) that dissolves in ..... of solvent at a particular temperature to form a ..... solution.

(*vi*) The substance left after the complete removal of water of crystallisation is termed ..... .

(*vii*) A student dissolved copper sulphate in water at 30°C until no more would dissolve. The solution obtained at 30°C is termed ..... .

(*viii*) Natural water fit for human consumption is called ..... water.

(*ix*) The number of water molecules, which enter in loose chemical combination with one molecule of a substance is called .....

(*x*) Anhydrous copper sulphate turns ..... on the addition of few drops of water.

Q. 34. Three substances A, B and C, were added to water. Substances A and C dissolved whereas substance B only very slightly dissolved. Substances A and B are chlorides and substance C contained calcium. Suggest identities for A, B and C (there is more than one possibility for each).

Substance A : .....

Substance B : .....

Substance C : .....

Q. 35. Solubility of sodium chloride solution at room temperature is 36g/100g of water. 200g of saturated solution of sodium chloride was allowed to evaporate when 75g of water evaporated. Calculate the amount of crystals deposited due to evaporation.

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Q. 36. Briefly explain how water cycle is maintained in nature ?

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Q. 37. What observations are made when a piece of sodium metal is added to a trough of water? Give a balanced chemical equation for the reaction between sodium and water.

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Q. 38. A small piece of calcium is dropped in a beaker containing cold water and a few drops of neutral litmus solution. Give your observations and write the balanced chemical equation for the reaction.

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.....

Q. 39. What observations are made when a burning magnesium spiral is introduced in steam generated from boiling water taken in a test tube ?

.....

.....

.....

.....

Q. 40. The solubility of sodium chloride at 20°C is 36 g. What weight of NaCl will be left when 50 g of its saturated solution at 20°C is evaporated to dryness?

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.....

.....

Q. 41. 60g of a saturated solution of KCl at 20°C, when evaporated to dryness, leaves a solid residue of 15.2 g. Calculate the solubility of KCl at 20°C.

.....

.....

.....

Q. 42. Fill in the blanks :

(*i*) The oceans cover over ..... of earth's surface.

(*ii*) Nearly ..... of human body is composed of water.

(*iii*) Green vegetables contain ..... water.

(*iv*) Milk contains ..... water.

(*v*) Thick layers of water appear ..... or ..... due to scattering of light.

Q. 43. What is meant by water pollution ?

.....

.....

.....

Q. 44. Name the major water pollutants.

1. ..... 2. .....

3. ..... 4. .....

5. ..... 6. .....

Q. 45. What are the major diseases causes by polluted water ?

.....

.....

.....

Q. 46. Name some important methods to kill microorganisms.

1. ..... 2. ..... 3. .....

Q. 47. (*i*) Why is chlorine bubbled through water during treatment ?

.....

(*ii*) Which process is used to remove large objects such as tree leaves from water ?

.....

(*iii*) Which process removes suspended solids from water ?

.....

(*iv*) In the recycling of water, waste water is sprayed on to a large bed of gravel where much of the waste is broken down. What breaks down the waste ?

.....

MULTIPLE CHOICE QUESTIONS

Select the correct answer from the choices A, B, C, D which are given. Write only the letter corresponding to the correct answer.

1. Which of the following is not a chemical pollutant

A. Solid wastes **B.** Liquid wastes **C.** Pesticides **D.** Noise

2. Which is a major source of thermal pollution in water bodies ?

A. Thermal power plants **B.** Sewage treatment plants

C. Solid waste disposal sites **D.** All of the above

7 CHAPTER

ATOMIC STRUCTURE

Q. 1. Define the following terms :

(*i*) Sub-atomic particle : .....

.....

(*ii*) Fundamental particle : .....

.....

(*iii*) Anode : .....

.....

(*iv*) Cathode : .....

.....

Q. 2. Name the discoverers of the following :

(*i*) Atom : .....

(*ii*) Nucleus : .....

(*iii*) Cathode rays : .....

(*iv*) Electron : .....

(*v*) Proton : .....

(*vi*) Neutron : .....

Q. 3. Name the three fundamental particles of atom. Give the symbol with charge on each particle, mass, charge and location of each of them in the table given as follows :

Name	Symbol	Charge (Coulombs)	Mass (Kg) (amu)	Location
1. 2. 3.				

Q. 4. Define the following :

(*i*) Electron : .....

.....

(*ii*) Proton : .....

.....

(*iii*) Neutron : .....

.....

Q. 5. (*a*) Give two conditions under which cathode rays are produced.

(*i*) ..... (*ii*) .....

(*b*) State three main properties of electrons .....

.....

.....

Q. 6. (*a*) Name the fundamental particles present in the nucleus.

(*i*) ..... (*ii*) .....

(*b*) What do the following symbol represent ?

(*i*) A : ..... (*ii*) Z : .....

(*iii*) $_{-1}^{0}e$ ..... (*iv*) $_{1}^{1}p$: .....

(*v*) $_{0}^{1}n$: .....

Q. 7. Define the following :

(*i*) Atomic number : .....

.....

(*ii*) Mass number : .....

.....

(*iii*) Isotopes : .....

.....

(*iv*) Atomic mass : .....

.....

(*v*) Electronic configuration : .....

.....

(*vi*) Valence electrons : .....

.....

Q. 8. Give postulates of the Rutherford's Atomic Model.

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.....

.....

Q. 9. (*a*) What information does the atomic number gives ?

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.....

.....

(*b*) Why does the mass number excludes the mass of electrons ?

.....

.....

Q. 10. (*a*) The atomic number and mass number of sulphur are 16 and 32 respectively. What information is conveyed by this statement ?

.....

.....

(*b*) The atom of an element is made up of 11 protons, 12 neutrons and 11 electrons. What is its atomic number and mass number ?

.....

.....

Q. 11. An atom is made of charged particles called protons and electrons. Yet, an atom is electrically neutral. Explain.

.....

.....

.....

Q. 12. Five atoms are labelled V to Z.

Atoms	Mass Number	Atomic Number
V	40	20
W	19	9
X	7	3
Y	16	8
Z	14	7

Which of these atoms (*i*) contains 7 protons (*ii*) has electronic configuration 2, 7 ? **(1998)**

(*i*) .....

(*ii*) .....

Q. 13. Copy and complete the following table relating to the atomic structure of some elements:

Element	Atomic Number	Mass Number	Number of Protons	Number of Neutrons	Number of Electrons
Beryllium	4	9			
Fluorine	9			10	
Sodium				12	11
Aluminium		27			13
Phosphorus		31	15		

(1994)

Q. 14. (*a*) What is the relation between the number of protons and the number of electrons in an atom ?

.....

(*b*) What would be the reason for an element to have atoms with different mass numbers?

.....

.....

(*c*) The electronic structure (configuration) of fluorine atom can be written as 2, 7. In a similar way, give the electronic configuration of :

(*i*) Aluminium .....

(*ii*) Phosphorus .....

Q. 15. $^{24}_{12}Mg$ and $^{26}_{12}Mg$ are the symbols of two isotopes of magnesium. Compare the atoms of these isotopes with respect to (*i*) Composition of their nuclei (*ii*) Electronic configuration. (*iii*) Give reasons why two isotopes of magnesium have different mass numbers.

.....

.....

Q. 16. Copy and complete the table given below :

Element	Number of Protons	Number of Electrons	Number of Neutrons
$^{35}_{17}Cl$			
$^{37}_{17}Cl$			

(*i*) What is the name given to pair of atoms such as $^{35}_{17}Cl$ and $^{37}_{17}Cl$?

.....

(*ii*) Why the two atoms in the table above have similar chemical properties?

.....

.....

.....

(*iii*) Why the relative mass of chlorine is not a whole number ?

.....

.....

.....

Q. 17. Ordinary chlorine has two isotopes $^{35}_{17}Cl$ and $^{37}_{17}Cl$ in the ratio 3 : 1. Calculate the relative atomic mass (atomic weight) of chlorine.

.....

.....

.....

.....

Q. 18. According to Dalton's atomic theory, atoms of the same element are identical in all respects. However, according to the modern atomic theory, this postulate is proved wrong. Explain.

.....

.....

.....

Q. 19. From the symbol $^{4}_{2}He$ for the element helium, write down the mass number and the atomic number of the element.

(*i*) .....

(*ii*) .....

Q. 20. Complete the following :

(*i*) The anode rays obtained from hydrogen gas consists of particles called ..... .

(*ii*) The nature of positive rays ..... upon the gas taken in the discharge tube.

(*iii*) The neutron has ..... charge.

(*iv*) The fundamental particle not present in a hydrogen atom is ..... .

(*v*) The charge on a proton is ..... and the charge on an electron is ..... .

Q. 21. Describe briefly the Bohr's concept of atom.

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Q. 22. Write the number of protons, electrons and neutrons present in each of the following elements, give the electronic configuration and draw the atomic diagrams.

(*i*) Helium : $^{4}_{2}He$

p : .... e: ... n : ....

Electronic configuration : .....

Atomic diagram : .....

(*ii*) Magnesium : $^{24}_{12}Mg$

p : ... e : .... n : .....

Electronic configuration : .....

Atomic diagram : .....

(*iii*) Neon : $^{20}_{10}Ne$

p : ... e : ... n : ....

Electronic configuration :.....

(*iv*) Hydrogen $^{1}_{1}H$

p : .... e : ... n : ...

Electronic configuration : .....

(*v*) Chlorine : $^{35}_{17}Cl$

p : ... e : ... n : ...

Electronic configuration :

Atomic diagram :

(*vi*) Potassium : $^{39}_{19}K$

p : ... e : .... n : ....

Electronic configuration :

Atomic diagram :

(*vii*) Lithium : $^{7}_{3}Li$

p : .... e : .... n : ....

Electronic configuration : .....

Atomic diagram :

(*viii*) Aluminium : $^{27}_{13}Al$

p :.... e :.... n : ....

Electronic configuration :.....

Atomic diagram :

Q. 23. Three different atoms of hydrogen are represented as $^{1}_{1}H$; $^{2}_{1}H$; $^{3}_{1}H$.

(*a*) What do the subscripts and superscripts represent ? .....

.....

(*b*) What factor is responsible for change in superscripts 1, 2 and 3 though the element is same ?

.....

.....

(*c*) What is the appropriate term for elements having such property ?

.....

(*d*) Draw the atomic structure of $^{3}_{1}H$.

.....

Q. 24. Complete the following statements :

(*i*) According to modern concept of atom, electrons are present ..... the nucleus in definite energy levels.

(*ii*) Cathode rays travel from ..... to ..... in a discharge tube.