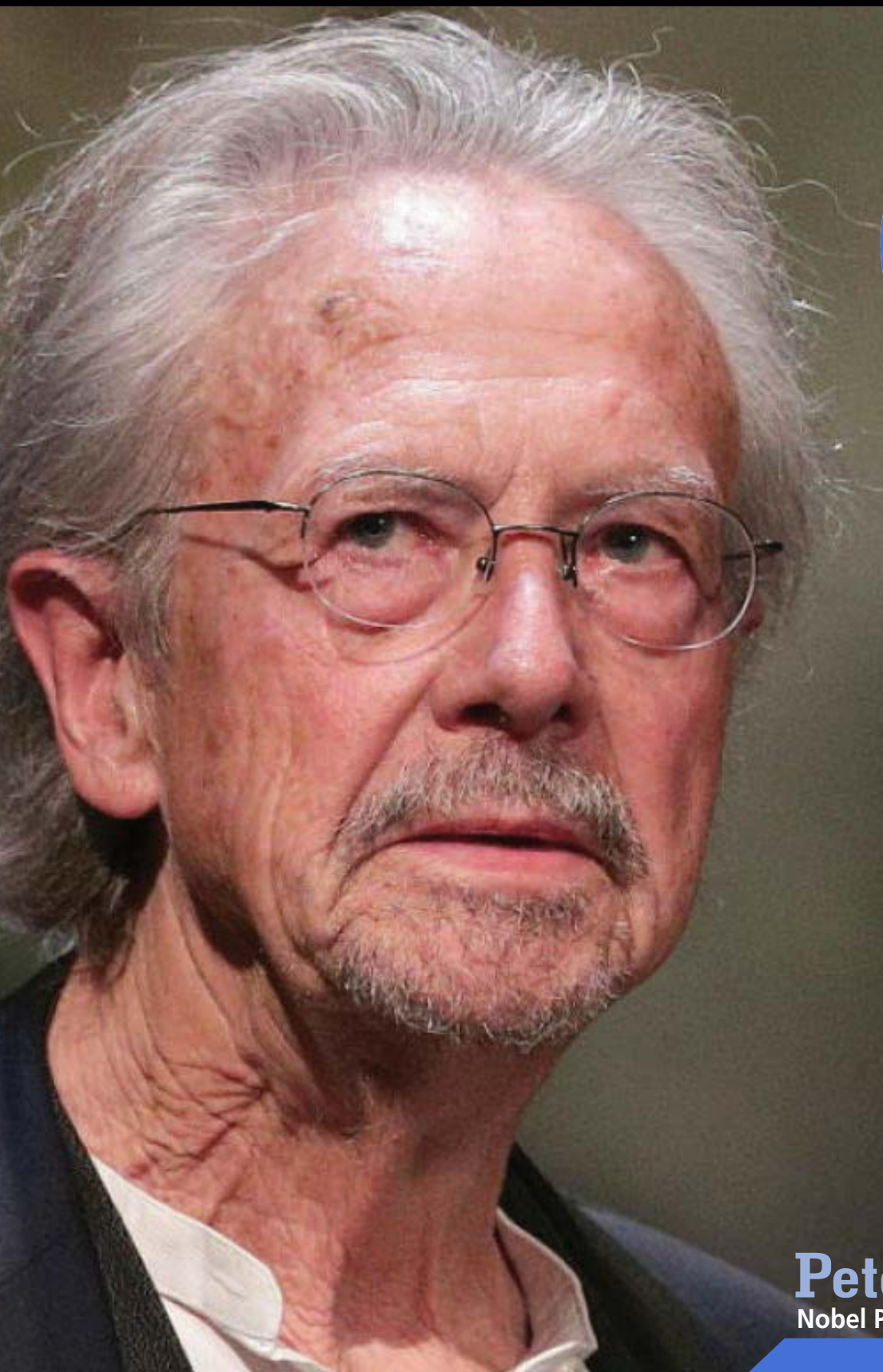
APRIL 2020
VOLUME-1
ISSUE -1

AN EDUCATIONAL QUARTERLY JOURNAL

₹ 250/-

EDUmate

A BEACON OF FUTURE



CLASS 10 CBSE

ENGLISH

SCIENCE

REAL NUMBER
EUCLID'S DIVISION LEMMA

MATHEMATICS

SOCIAL SCIENCE

Peter Handke

Nobel Prize Winner 2019 (Literature)

EDUmate
A BEACON OF FUTURE

A COMPLETE EDUCATIONAL QUARTERLY JOURNAL FOR CLASS -10 CBSE.

Today's world is very competitive and to pace with time, it's important for every student to have complete grasp of concepts in each subject. EDUMATE's simple and detailed presentation by the well experienced educationists will help students to have integral understanding about the subjects thoroughly. Reading the NCERT text book is the first step to face the board examination. Once you have gone through the text book, EDUMATE helps you to be a true friend, whom you can always keep along. This will help you understand and visualize the topics to get the core of the subjects.

There will be four volumes in an Academic Year inclusive of four main subjects such as **English, Science, Mathematics and Social Science with Info- Junction and Career Guidance as a regular feature**. As it is the need of the hour, we will also try to incorporate materials for **FOUNDATION for JEE, NEET, NTSE, KVPY, AIIMS** etc., in the upcoming volumes.

THE SALIENT FEATURES OF OUR JOURNAL

- **Comprehensive analysis of each lesson.**
- **Answers to textual questions.**
- **Additional questions and answers.**
- **Previous year's Board Exam questions solved.**
- **Exam Special Issues.**

Ensure your copies of Edumate – A Beacon of Future Right Today!

PUBLISHED BY :

Edumate Publications, 29/B, Pocket A/3,
MayurVihar Phase 3, Delhi -110096,
Ph. +91.8527766236,
E-mail: edumatenewdelhi@gmail.com

EDUmate
A BEACON OF FUTURE

CONTENTS

EDITORIAL

Dear learners,

Learning is a continuous process, which involves thinking, articulating, storing, remembering, using, parting and so on. Everyone learns, relearns and unlearns. It becomes an asset for the life. This can never be stolen and it cannot be bought too. It can only be gained. There are lots of ways by which one attains knowledge. What one attains, becomes ornament that shines and is part of one's own life. This is what makes one's life fruitful. To be fruitful one needs to be laborious. If one has gained something through easy means that will not sustain for a long period of time. Therefore, be a learner to be productive member of the society to think, to articulate, to store, to remember, to use, to impart by equipping oneself with the required skills. Proper learning creates lot of opportunities and these would lead to dispel the ignorance and would light up knowledge.

To be a help by being by your side to make your labour easy, we are presenting our humble effort in the form of a magazine named 'EDUMATE'. This is a collective endeavour to reach to the aspirants to make the study easier and also to let you know the day to day affairs. We have tried our level best to incorporate everything required to make a student's study process easy and effective. If our efforts stand helpful for your studies then the herculean task that we started will be fruitful.

No doubt this creative endeavour will bring about an array of knowledge bearing sweetest fruit ever. Let the knowledge sown today bring forth its best fruit with the help of 'EDUMATE'.

To you from us with love…

Geo John
Chief Editor

Life ... Love... Learn... to be a Change

FR. SIJU JOHN, M.A., M.Ed.

'You must be the change you wish to see in the world', one of the perfect words of Gandhiji in this new modern fast moving world when everyone wants to perceive changes and fetch changes in the life of others but not in oneself. We call for changes in life and no one would like to be idle in his/her life. We do apply certain words often in our conversation and they are life, love and learn.

LIFE.....

"Twenty years from now you will be more disappointed by the things you didn't do than by the ones you did do. So throw off the bowlines. Sail away from the safe harbor. Catch the trade winds in your sails. Explore, Dream, Discover." **– Mark Twain.**

The American writer's words about life have a lot of relevance for today's young buds. Life is to be explored in all meaning. It's not a free gift but heavily compensated by our dear parents, our visible gods on earth. Every player has a coach but the coach is not always a better player. We have to explore ourselves and to explore we need to dream and discover. Every unearthing initiate with a dream and a better dreamer discovers better. Discovery begins from within and why don't we take a step forward; a step which is rare, bold and distinctive.

LOVE .....

"Love is an untamed force. When we try to control it, it destroys us. When we try to imprison it, it enslaves us. When we try to understand it, it leaves us feeling lost and confused." **Paulo Coelho**

The Brazilian novelist says that the love is a force. The force, which comes from the heart, penetrates the hearts of others and is the germ of life. It cultivates the worth of life and our young buds have to get the imprint of this precious germ. Today the world is more educated but has less common sense, more degrees but has less capacity of judgment, bigger houses but has small families, big personalities but has less character, spends a lot but has less happiness and conquered the whole world but has lost the germ of life i.e. love. We, the human beings, try to dominate but love cultivates peace which frees us from the burden and pains of life. Let our educators, parents, peer groups, friends and so on nurture the germ of life to our young buds. We can cultivate it by giving a feather touch of love.

LEARN .....

'By three methods we may learn wisdom: First, by reflection, which is noblest; Second, by imitation, which is easiest; and third by experience, which is the bitterest.' **– Confucius**

The Chinese philosopher says that the toughest way of learning is by experience. A blind person makes a decision after experiencing. He sees the things through his heart because only his eyes are closed not his heart/mind. We have to keep our hearts open to learn by experience and learning through heart is love. The more I read, the more I acquire but the more I love, the more I learn to live. The most precious learning is learning of the meaning of love since all learning has an emotional base. We must learn to live together than leaning various languages and sciences. The standard of living is what we have but the standard of life is what we give from our heart.

BE A CHANGE .....

*"The secret of change is to focus all of your energy not on fighting the old, but on building the new."***-Socrates**

To be a change, we need to have clarity of mind and heart and this clarity is acquired through life, love and learning. In order to be a change or revolutionary one must have the vision and heart of a giraffe. Giraffe has a small, powerful, supercharged heart that is different to that possessed by other similar animals and has a holistic vision from above. We obtain speed in life by technology but the directon has to be from a heart which has knowledge by experience. Let us direct our young buds from our experienced hearts to bring changes in their life and lives to come. Therefore we shall lead a simple life but a rich burial by the triumph of our life.

GET UP FROM THE FALL TO WIN

GEO JOHN, M.A., B.Ed.

INTRODUCTION

The moment one thinks about one's own capabilities and is confident about the caliber, he/she will emerge as victorious. Success is the result of positivity. When a person is positive and is with wonderful courage to take up risks can taste triumph and when one is passive and do nothing productive will have a great fall and that would be irreversible. Being positive will make great things possible to those who don't stop believing in oneself, trying something new or better and learning to be different. Be inquisitive to be different, and if you want to be different you need to be different. Being inquisitive will open up to new ideas and these ideas will sprout, grow and yield fruits.

Be curious to win

It is necessary to be curious and curiosity according to Ian Leslie is a combination of intelligence, persistence and hunger for novelty, all wrapped up in one. In order to improve curiosity and wonder one needs to read widely and should follow one's interests. It is said that when you are running into something interesting, drop everything and study it. The feeling of being interested can act as a kind of neurological signal, directing us to fruitful areas of inquiry.

Be thirsty to accomplish your target

The thirst to have fruitful enquiry will lead to fill up and accomplish the target. It will also help one to polish mind with the minds or thoughts of others. One can always be benefitted with the progressive ideas of others. It simply means to consult with the experts to be experts. These ideas will either support or would leave the spark to think what is next. If your ideas can get wings using others' thoughts there is no wrong in it but one should make sure that it is productive and never be destructive.

Do not take up shortcuts

We have crippled ourselves in finding out shortcuts in every way possible. Though we have the potential source, we do not want to rely on anything that would demand time. Even any kind of information we require is to be available at our finger tips, if not, it is very difficult to pass moments. Today's generation is born to Google. In the era of Google searches, we have no problem finding the exact answer to our questions, but by chance likely to encounter information that is not specific or relevant to our question or queries. It is said that a serendipity deficit makes innovation harder, because innovation relies on unexpected collision of knowledge and ideas. So, it is the fact that we don't exactly get the answers perfect for our questions.

Give wings to your passions

All what you do might be meaningless or absurd for the people watch you from far, but you should never allow your passion and interests to die. Once they are no more with you, then the life will be pathetic and difficult to pursue. On the go there are chances, where you might fall down many times but your passion and interests would be your help in standing on your own foot. You must keep your passion alive and no outer forces can have access on you. This must be your strength to get up from the fall. Falling down would give us experiences and these experiences are the driving forces to stand up. An ant while carrying the grain might fall down many times but it will not stop carrying grains because of the fear of falling down. Life is similar to this. If one wants to sustain life, then it is necessary to have lots of experiences of falling down and getting up. Learn lessons from every instance of your life and this would be a force to live on.

Conclusion

I am the master of my life and everything that is required to stand on my own foot it's within me. If I am able to stand to be different by being curious to win starts my auspicious time and this so called auspicious time is within and will be out of your reach if you are to search elsewhere. Do not be satisfied with the knowledge you have but equip and update yourself at every moment by not taking the shortcuts to win rather shed your perspiration for your cause. If you are determined you will never at the place where you fell but you would fly to the heights by the wings that are created by you to win always.

MY CAREER: THE PATH FINDER

SHAJU JOSEPH, M.A,. M. Phil., B. Ed., MBA

Choosing a career after schooling is considered to be the most important activity in a student's life. But the question that baffles everybody is, **'What to choose?'** and **'How to choose?'** Unfortunately these questions remain unanswered in most of the children's lives. The reason…?

In a world where the children get everything 'readymade', this problem is bound to happen. In a world where the children are just taught about the price of things and not the value, this is bound to happen and in a world where the children are not taught to take up the responsibilities or face the challenges and stand on their own legs, this is bound to happen. The parents- especially our (Indian) parents are so concerned about their children's future that they want to have everything ready for them as they grow up and finally a high profile blue collar job with a fat six/ seven digit pay cheque. Once they achieve this – the parents are happy and content that their son/ daughter is well settled.

It looks good and everybody is fine with it. Moreover this is what 90% of the present generation wants. Gradually what happens is – they get fed up with the unending stress related to work, meeting the targets, satisfying the boss etc. In the struggle to keep up with the expectations of the employers and the society, they forget their family life, their children's social and emotional growth, the spouse, the parents and relations. Not only that the extreme stress makes the person mentally and physically tired. The rest of the life is spent going to the hospitals, eating loads of medicines as food etc. or to make things worse, he/ she may get into depression or even commit suicide.

How do these things happen? Was this what was envisioned? Was it the destiny / the life parents wanted the children to have?

No- Obviously No is the answer. Then Why …? why should this happen ? Let us look back to the two questions that we left behind – **What to choose? and How to choose?**

These two questions are quintessentially important because a choice that one makes at a critical point of time makes all the difference. Every apprentice searching for a happy life, should earnestly work on What to Choose- not choose what they have been told to by the parents , relatives or the so called well- wishers or not a career to satisfy your parents or your own social status. The choice should ultimately based on your own interests , your own passion and your own heart's desire - failing in which whatever you do will become just a job , a burden and it will never make you happy.

As we discussed, what to Choose entirely depends on your passion, love, affinity and attachment. Your parents / teachers can surely guide you or support you but make sure you be the decision maker. When you go after what you are passionate about, you are bound to enjoy what you do. It will never be a burden for you or even a 'work' for you but it will be the most interesting activity, or 'time pass' for you as you get completely involved in it. As the maxim goes 'Do what you love and Love what you do'.

In the words of Dr. A P J Abdul Kalam, 'If you do what you love, you don't need to work even a single day in your life. So it becomes imperative to make a correct choice before selecting a particular profession.'

Now let's discuss how to identify your passion, your interest or what to do with your life. I hope the following questions will help you to make the choice. Ask yourself the same/ similar questions.

- What do I enjoy doing?
- What kind of activities are fun and fulfilling for me?
- What am I good at?
- What Skills do I have to excel in what I do?
- What are my capabilities?
- What are my drawbacks and what do I do to improve upon them?
- How much time do / can I spend to sharpen my skills?
- How confident am I?
- How strong is my Intrapersonal as well as my Interpersonal skills?
- Am I willing to / able to face the challenges that emerge in this field?

If you are able to find satisfying answers to these questions, be sure that you are on the right track. Develop a strong proactive mindset and 'Never say Die' attitude and an unrelenting thirst to achieve what you value the most and it will surely make your life and you will be happy and your life will be meaningful. As Swami Vivekananda reminds us " Arise, awake and stop not until the goal is reached".

CHEMICAL REACTIONS AND EQUATIONS

TOPICS

- Introduction
- Chemical reaction
- Chemical equation
- Balanced chemical equation
- Types of chemical reaction
- Corrosion
- Rancidity

INTRODUCTION

Most of the substances around us undergoes various changes. Some of these changes are temporary with no new substance being formed, which may be physical change or chemical change. Whenever chemical change occurs, we can say that a chemical reaction has taken place. In this chapter we will learn about the chemical reaction, types of chemical reactions, chemical equation, how to balance the chemical equation and about the effects of oxidation reactions in everyday life.

CHEMICAL REACTION

Chemical reaction is the process by which two or more substances react with each other to form new substances with different properties.

Characteristics of chemical reactions

(i) Change in state

(ii) Change in colour

(iii) Evolution of gas

(iv) Change in temperature

CHEMICAL EQUATION

A chemical equation is the symbolic representation of a chemical reaction in the form of symbols and formulae, wherein the reactant entities are given on the left-hand side and the product entities on the right-hand side.

Magnesium + oxygen → magnesium oxide

(Reactant) (Product)

BALANCED CHEMICAL EQUATION

The chemical equation that shows the chemical reaction needs to be balanced. A balanced chemical equation occurs when the number of the atoms involved in the reactants side is equal to the number of atoms in the products side.

$Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$

$3Fe\ (s) + 4H_2O\ (g) \rightarrow Fe_3O_4\ (s) + 4H_2\ (g)$

TYPES OF CHEMICAL REACTIONS

1) Combination reaction: A single product is formed from two or more reactants is known as a combination reaction.

CaO (s) + H2O (l) → Ca(OH)2 (aq)

Calcium oxide reacts vigorously with water to produce slaked lime (calcium hydroxide) releasing a large amount of heat.

2) Exothermic reaction: An exothermic process releases heat, and causes the temperature of the immediate surroundings to rise. The rice, potatoes and bread we eat contain carbohydrates. These carbohydrates are broken down to form glucose. This glucose combines with oxygen in the cells of our body and provides energy. The special name of this reaction is respiration is an exothermic reaction.

$C_6H_{12}O_6\ (aq) + 6O_2\ (aq) \rightarrow 6CO_2 + 6H_2O\ (l) + energy$

(glucose)

3) Endothermic reaction: An endothermic process absorbs heat and cools the surroundings. The decomposition of vegetable matter into compost is an example of an endothermic reaction.

4) Decomposition reaction: When a single reactant breaks down to give simpler products, it is called a decomposition reaction.

White silver chloride turns grey in sunlight. This is due to the decomposition of silver chloride into silver and chlorine by light.

5) Displacement reaction: Displacement reaction is a chemical reaction in which a more reactive element displaces a less reactive element from its compound. Both metals and non-metals take part in displacement reactions. Reaction of iron nails with copper sulphate solution.

$Fe(s) + CuSO_4\ (aq) \rightarrow FeSO_4(g) + Cu\ (s)$

$Pb(s) + CuCl_2\ (aq) \rightarrow PbCl_2(aq) + Cu\ (s)$

6) Double Displacement reaction: A double displacement reaction, also known as a double replacement reaction or metathesis, is a type of chemical reaction where two compounds react and the positive ions and the negative ions of the two reactants switch places forming two new compounds or products.

7) Redox reaction: An oxidation-reduction (Redox) reaction is a type of chemical reaction that involves transfer of

electrons between two species. An oxidation-reduction reaction is a chemical reaction in which the oxidation number of a molecule, atom, or ion changes by gaining or losing electrons.

Oxidation: This process involves gain of oxygen or loss of hydrogen.

Reduction: This process involves gain of hydrogen or loss of oxygen.

Oxidizing Agent

It is the substance which gives oxygen or gains hydrogen. Or it is the substance which is reduced itself and oxidizes other.

Reducing Agent

It is the substance which gives hydrogen or gains oxygen or it is the substance which is oxidized itself and reduces other. Oxidation is the process which involves loss of electrons but reduction is the process which involves gain of electrons.

CORROSION

The process of slow conversion of metals into their undesirable compounds due to their reaction with oxygen, water, acids, gases etc. present in the atmosphere is called corrosion.

Rusting – Iron when reacts with oxygen and moisture forms red substance called rust.

RANCIDITY

Rancidity is the development of unpleasant smells in fats and oils, which are often accompanied by changes in their texture and appearance. The taste and odour of food materials containing fat and oil changes when they are left exposed to air for a long time. This is called rancidity. It is caused due to oxidation of fat and oil present in food material. There are two types of rancidity: Hydrolytic and Oxidative rancidity (auto-oxidation)

MULTIPLE CHOICE QUESTIONS

Q1. A Chemical reaction has taken place in which of the following process.

a. Ice melts into water.
b. A wet shirt got dried in sunlight.
c. A brown layer is formed over iron rod kept in air.
d. Sugar getting dissolved in water.

Ans. c. A brown layer is formed over iron rod kept in air

Q2. Which of the following is not a chemical reaction

a. Formation of salt solution
b. Grapes ripening
c. Food get digested in our body
d. Burning of match stick

Ans. a. Formation of salt solution

Q3. A chemical reaction has taken place can be represented by which of the following conditions.

a. Evolution of gas
b. Heat released
c. Change in colour
d. All the above

Ans. d. All the above

Q4. A chemical equation properly written has which of the following features.

a. Temperature required
b. Should be balanced
c. Should have information regarding physical states
d. All the above

Ans. d. All the above

Q5. A chemical equation should be balanced to

a. Display conservation of energy
b. Display conservation of mass
c. To make equation attractive
d. All the above

Ans. b. Display conservation of mass

Q6. An unbalanced chemical equation is equation written in

a. Skeletal form
b. Proper form
c. Simple form
d. Unorganized form

Ans. a. Skeletal form

Q7. A chemical equation is said to be balanced if number of

a. Compounds are same on both side
b. Molecules are same on both side
c. Number of atoms are same on both side
d. Number of electron are same on both side.

Ans. c. Number of atoms are same on both side

Q8. When magnesium is burnt in air then

a. Magnesium is reacting with oxygen
b. Magnesium is reacting with nitrogen
c. Magnesium is reacting with carbon
d. Magnesium is reacting with carbon dioxide

Ans. a. Magnesium is reacting with oxygen

Q9. Write values of a, b and c if following chemical reaction is balanced.

$$aH_2 + bO_2 \rightarrow cH_2O$$

a. a = 2, b = 1, c = 2
b. a = 1, b = 1, c = 2
c. a = 2, b = 2, c = 1
d. a = 1, b = 2, c = 2

Ans. a. a = 2, b = 1, c = 2

10. Write values of a, b, c if following chemical reaction is balanced.

$$a\,Mg + bO_2 \rightarrow cMgO$$

a. a = 1, b = 2, c = 2
b. a = 2, b = 1, c = 2
c. a = 2, b = 2, c = 2
d. a = 1, b = 2, c = 1

Ans. b. a = 2, b = 1, c = 2

Q11. Write values of a, b, c and d so that following Chemical equation is balanced

a Al + b HCl_2 → C Al Cl_3 + dH_2

a. a = 1, b = 3, c = 1, d = 3

b. a = 2, b = 6, c = 2, d = 2

c. a = 2, b = 6, c = 2, d = 3

d. a = 2, b = 3, c = 2, d = 3

Ans. c . a = 2, b = 6, c = 2, d = 3

Q12. Which of the following reactions satisfies this condition.

Iron nail kept with dilute sulphuric acid, ferric sulphate solution is formed and hydrogen gas is released.

a. 2 Fe(s) + 3 $H_2SO4(I)_2$ → $Fe_2(SO_4)_3$ (1) + $3H_2(g)$

b. 2Fe(s) + $2H_2SO_4(aq)_2$ → $Fe_2(SO_4)_3(s)$ + $4H_2$ (g)

c. 2Fe(s) + $2H_2SO_4(aq)$ → $3Fe_2(SO_4)_3(aq)$ + $2H_2(g)$

d. 2Fe(s) + $2H_2SO_4(aq)$→ $Fe_2(SO_4)_3(aq)$ + $3H_2(g)$

Ans. d. 2Fe(s) + $2H_2SO_4(aq)$→ $Fe_2(SO_4)_3(aq)$ + $3H_2(g)$

Q13 LPG gas which we use in our home is basically butane gas (C4H10) it is burnt in presence of air. This is an exothermic reaction and energy released is used to cook. Carbon dioxide gas and steam is product for this reaction which of the following represents proper chemical equation for this process

a. C_4H_{10} (g) + $3O_2(g)$ → $4CO_2(g)$ + $5H_2O(i)$

b. $2C_4H_{10}$ (g) + $11O_2$ (g) → $7CO_2$ (g) + $10H_2O$ (g)

c. $2C_4H_{10}$ (g) + $11O_2$ (g) → $7CO_2$ (g) + $10H_2O$ (g)

d. $2C_4H_{10}$ (g) + $13O_2g$ → $8CO_2$ (g) + 10 H_2O (g)

Ans. d. $2C_4H_{10}$ (g) + $13O_2g$ → $8CO_2$ (g) + 10 H_2O (g)

Q14. The main component of Biogas is methane (CH4). It burns to generate energy. The carbon dioxide gas and water in gaseous form is obtained as product of combustion of methane. Which of the following represents the chemical reaction properlya. CH_4 (g) + $2O_2$ (g) → CO_2 (g) + $2H_2O$ (g)

b. $2CH_4$ (g) + $4O_2$ (g)→ $2CO_2$ (g) + $2H_2O$ (g)

c. $2CH_4$ + $3O_2$ (g) → CO_2 + $2H_2O$ (g)

d. CH_4 + $2O_2$ → CO_2 + $2H_2O$ (g)

Ans. a. CH_4 (g) + $2O_2$ (g) → CO_2 (g) + $2H_2O$ (g)

Q15. Calcium oxide react with water to form calcium hydroxide. Which of reaction is this.

a. Combination and endothermic reaction

b. Combination and exothermic reaction

c. Decomposition and Endothermic reaction

d. Decomposition and exothermic reaction.

Ans. b. Combination and exothermic reaction

Q16. Combustion of methane gas is

a. Exothermic reaction

b. Endothermic reaction

c. Combination reaction

d. Both (a) and (b)

Ans. a .Exothermic reaction

Q17. What kind of reaction respiration is

a. Exothermic

b. Endothermic

c. Decomposition

d. Both (a) and (b)

Ans. a. Exothermic reaction

18. A smell of burning sulphur is obtained when ferrous sulphate is heated. Why?

a. Evolution of Sulphur dioxide

b. Formation of ferric oxide

c. Formation of ferrous sulphate

d. None

Ans. a. Evolution of Sulphur dioxide

19. Which of the following is/are uses of calcium carbonates?

a. White washing

b. Marble manufacturing

c. Building material

d. All

Ans. d. All

Q20. On thermal decomposition of lead nitrate, nitrogen dioxide gas is evolved. How can its presence be verified?

a. It will turn lime water milky

b. Rotten egg odour

c. Brown fumes can be observed.

d. Reddish fumes is observed.

Ans. c. Brown fumes can be observed

Q21. After two or three days of white washing 'it' give shiny finish to the wall. What is 'it'?

a. Calcium hydroxide

b. Carbon dioxide

c. Calcium carbonate

d. Calcium hydroxide

Ans. c. Calcium carbonate

Q22. Formation of water from H2(g) and O2(g) is

a. Combination reaction

b. Decomposition reaction

c. Endothermic reaction

d. Exothermic reaction

Ans. a. Combination reaction

Q23. The decomposition of vegetable in to compost is

a. Endothermic reaction

b. Exothermic reaction

c. Combinations reaction

d. both (b) and (c)

Ans. d. both (b) and (c)

Q24. Heating of lead nitrate and emission of nitrogen dioxide is

a. Combination reaction

b. Exothermic reaction

c. Endothermic reaction

d. Thermal decomposition

Ans. d. Thermal decomposition

Q25. Iron nail dipped in copper sulphate solution to form iron sulphate and copper is

a. Combination reaction
b. Decomposition reaction
c. Displacement reaction
d. Double displacement reaction

Ans. c. Displacement reaction

Q26. An oxidation reaction takes places in which of the following process?

a. Respiration
b. Rusting of iron
c. Making compost
d. Electrolysis of water

Ans. b. Rusting of iron

Q27. Balance the following chemical equation :

$Fe + H_2O \rightarrow Fe_3O_4 + H_2$ is

a. Fe + 4H2O→ Fe3O4 + H2
b. Fe + 4H2O → Fe3O4 + 4H2
c. 3Fe(s) + 4H2O(g) → Fe3O4(s) + 4H2(g)
d. $3Fe + 4H_2O \rightarrow Fe_3O_4 + H_2$

Ans. c. $3Fe_{(s)} + 4H_2O_{(g)} \rightarrow Fe_3O_4(s) + 4H_2(g)$

Q28. An example of combination reaction is

a. Burning of coal
b. Formation of water
c. Formation of slaked line
d. All

Ans. d. All

Q29. A redox reaction is

a. MnO2 + 4HCl → MnCl2 + 2H2O + Cl2
b. Zn + CuSO4 → ZnSO4 + Cu
c. CaCO3 → CaO + CO2
d. None

Ans. a. $MnO_2 + 4HCl \rightarrow MnCl_2 + 2H_2O + Cl_2$

Q30. What happens when dilute hydrochloric acid is added to iron filling? Tick the Correct answer.

a. Hydrogen gas and iron chloride are produced
b. Chlorine gas and iron hydroxide are produced
c. no reaction take place
d. Iron salt and water are produced

Ans. a. Hydrogen gas and iron chloride are produced

Q31. Which of the statements about the reaction below is correct ?(NCERT solutions)

$2PbO(s) + C(s) \rightarrow 2Pb(s) \rightarrow CO_2(g)$

a. Lead is getting reduced
b. Carbon dioxide is getting oxidized
c. Carbon is getting oxidized
d. Lead oxide is getting reduced

(i) (a) and (b)
(ii) (a) and (c)
(iii) (a), (b) and (c)
(iv) all

Ans. (i) (a) and (b)

Q32. Fe2O3 + 2Al → Al2O3 + 2Fe

The above reaction is an example of (NCERT Solution)

a. Combination reaction
b. displacement reaction
c. decomposition reaction
d. displacement reaction

Ans. d. displacement reaction

Q33. What happens when dilute hydrochloric acid is added to iron filling? Tick the correct answer.

a. Hydrogen gas and iron chloride are produced.
b. Chlorine gas and iron hydroxide are produced
c. No reaction take place
d. Iron salt and water produced

Ans. a. Hydrogen gas and iron chloride are produced

Q34. Write the values of a, b, c and d if following chemical reaction is balanced

a $Pb(NO_3)_2 \rightarrow bPbO + cNO_2 + dO_2$

a. a = 2, b = 1, c = 2, d = 4
b. a = 2, b = 2, c = 1, d = 4
c. a = 2, b = 2, c = 4, d = 1
d. a = 4, b = 2, c = 1, d = 2

Ans. c. a = 2, b = 2, c = 4, d = 1

Q35. Chips manufacturer usually flush bag of chips with gas 'X'. Name the 'X'.

a. Oxygen b. Hydrogen
c. Nitrogen d. Carbon dioxide

Ans. c. Nitrogen

II. Fill in the blanks

1. …… is formed due to the reaction between magnesium and oxygen.

Ans. Magnesium Oxide

2. A …….. represents a chemical reaction.

Ans. Chemical equation

3. $C6H12O6 (aq) + 60_{2\,(aq)} \rightarrow$ ……

Ans. $6CO_2(aq) + 6H_2O(l) + Energy$

4. The carbohydrates are broken down to form …….

Ans. Glucose

5. …… is called quick lime

Ans. Calcium oxide

6. Silver chloride turns grey in sunlight to form ……

Ans. Silver metal

7. Reaction in which energy is absorbed are known as …….

Ans. endothermic reaction

8. ……. And…… are more reactive element than copper

Ans. Zinc and lead

9. ……. that produces a precipitate.

Ans. Precipitation reaction

10. Silver chloride and silver bromide decomposed in the presence of sunlight. This reaction is used in …….

Ans. Black and white photography

11. $CuO + H_2 \xrightarrow{\text{heat}} Cu + H_2O$ is a …….. reaction.

Ans. redox reaction

12.…….. causes damage to car bodies.

Ans. Corrosion

13.……. represents the reactant, products and their physical state symbolically.

Ans. Chemical Equation

14. ……. is used in the manufacture of cement.

Ans. Calcium oxide (quick lime)

15. ……. is used in white washing walls.

Ans. Calcium hydroxide

III. Short Answer Questions

1. What is chemical change? Write an example.

Ans. Two or more substances react with each other to form new substance with different properties is called a chemical reaction or chemical change.

These are the following observations to determine that the chemical reaction has taken place.

i) Change in state
ii) Change in colour
iii) Evolution of gas and
iv) Change in temperature

Eg. Magnesium ribbon burnt in air

2. What is a chemical equation?

Ans. A chemical equation is the symbolic representation of a chemical reaction. In the form of symbols and formula it represents the reactants and products and their physical state symbolically.

Eg. Magnesium + Oxygen → Magnesium Oxide

$2Mg + O_2 \rightarrow 2MgO$

3. What is a Balanced Chemical equation?

Ans. An equation having an equal no. of atoms of each elements on both sides is called a balanced chemical equation.

Eg. $2Mg + O_2 \rightarrow 2MgO$

4. Why should the chemical equation be balanced?

Ans. According to the law of conservation of mass, mass can neither be created nor destroyed in a chemical reaction. That is the total mass of the elements present in the products of chemical reactions has to be equal to the total mass of the elements presents in the reactants. Hence we need to balance the chemical equation.

Eg. $Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$

5. What is the balanced chemical equation for carbon monoxide and hydrogen to form Methanol?

Ans.Carbon monoxide gas combines with hydrogen gas to form methanol at 340 atm pressure.

$CO + 2H_2(g) \rightarrow CH_3OH(l)$

6. What are the different type of chemical reactions?

Ans.The different types of chemical reactions are

i) Combination reaction
ii) Decomposition reaction
iii) Displacement reaction
iv) Double displacement reaction
v) Oxidation and reduction [redox reaction]

7. What is a combination reaction? Write an example.

Ans. A reaction in which a single product is formed from two or more reactants is known as a combination reaction.

Examples:

$C(s) + O_2(g) \rightarrow CO_2(g)$

$2H_2 + O_2(g) \rightarrow 2H_2O(l)$

8. Why is calcium hydroxide used in white wash?

Ans. Calcium hydroxide is a solution of quick lime and water. It is used for white washing walls as it slowly reacts with CO_2 in air to form a thin layer of calcium carbonate which gives a shiny finish to the walls.

9. What is the chemical formula of Marble?

Ans. The calcium hydroxide react with carbon dioxide in the air to form calcium carbonate (marble).

$Ca(OH)_2(aq) + CO_2(g) \rightarrow CaCO_3(s) + H_2O$

$CaCO_3$ is calcium carbonate

10. What is an exothermic reaction? Write an example.

Ans. A reaction in which heat is released along with the formation of products is called an exothermic reaction.

$CaO_{(s)} + H_2O\ (i) \rightarrow Ca(OH)_2\ (aq) + Heat$

11. Respiration is an exothermic reaction. Why?

Ans. The rice, potatoes and bread we eat contain carbohydrate. During digestion these food is broken down to form glucose. This glucose combines with oxygen in the cells of our body and provides energy. Therefore it is an exothermic reaction.

12. Explain endothermic reaction. Write an example.

Ans. A reactions in which energy is absorbed in the form of heat from the surroundings is called an endothermic reaction.

Eg. a. Photosynthesis

b. $2AgCl \rightarrow 2Ag(s) + Cl_2$

13. What are decomposition reactions? Write an example.

Ans. Reactions in which a single reactant break down to give simpler products are called decomposition reactions

Eg. $2FeSO_4(s) \xrightarrow{\text{heat}} Fe_2O_3(s) + SO_2(g) + SO_3(g)$

14. Write an example of decomposition reaction.

Ans. On heating lead nitrate brown fumes are emitted. These fumes are of nitrogen dioxide, oxygen gas and lead

oxide are also formed.

$2Pb(NO3)2\ (s) \rightarrow 2PbO\ (s) + 4NO2 + O2\ \ (g)$

15. Which reaction is used in Black and White photography? Explain.

Ans. The decomposition of silver chloride and silver bromide salt is used in Black and White photography.

Silver chloride decomposes in the presence of sunlight into silver and chlorine

$$2Agcl_{(s)} \underline{sunlight,} 2Ag(s) + Cl_2(g)$$

Silver bromide decomposes in the presence of sunlight into silver and bromine by light

$$2Ag\,Br_2 \underline{sunlight,} 2Ag(s) + Br_2(g)$$

16. Define displacement reaction. Write an example.

Ans. A Chemical reaction in which a more reactive element displaces a less reactive element from its compound is called displacement reaction.

Eg. Reaction of iron nail with copper sulphate solution

$Fe(s) + CuSO_4\ (aq) \rightarrow FeSO_4(aq) + Cu(s)$

(Iron) (copper sulphate) (iron sulphate) (copper)

17. Zinc and Lead displace copper from its compound. Why?

Ans. Zinc and Lead displaces copper from its compound because Zinc and Lead are more reactive elements than copper

$Zn(s) + CuSO_4(aq) \rightarrow ZnSO_4\ (aq) + Cu(s)$

(Zinc) (Copper sulphate) (Zinc sulphate)

Zinc displaces the copper from copper sulphate solution

$Pb(s) + CuCl_2\ (aq) \rightarrow PbCl_2(aq) + Cu(s)$

(Lead) Copper chloride Lead chloride

Lead displaces the copper from copper chloride solution.

18. Explain double displacement reaction? Write an example?

Ans. A Chemical reaction in which there is an exchange of anions and cations between the reactants are called a double displacement reaction.

Example:

$NaSO_4(aq) + BaCl_2 \rightarrow BaSO_4 + 2NaCl(aq)$

(sodium sulphate) (Barium Chloride) (Barium sulphate) (Sodium Chloride)

19. What is a precipitation reaction? Write an example.

Ans. A chemical reaction in which one of the products is an insoluble substance called precipitate is called a precipitation reaction.

$NaNO_3 + NaCl \rightarrow AgCl + NaNO_3$

(Silver Nitrate) (Sodium Chloride) (Silver Chloride) (Sodium Nitrate)

In this reaction Silver Chloride (AgCl) is precipitate that is AgCl is insoluble in water.

20. If we mix the solution of lead (II) nitrate and potassium iodide

i. What was the colour of precipitate formed? Write the name.

ii) Write the balanced chemical equation.

iii) Is this is a double replacement reaction ?

Ans. i) When lead nitrate and potassium iodide solution are mixed together to form lead iodide and potassium nitrate is formed. Lead iodide is the precipitate which show yellow colour.

ii) Balanced chemical equation is

$Pb(NO_3)_2 + 2\,KI \rightarrow 2KNO_3 + PbI_2$

(lead Nitrate) (Potassium iodide) (Potassium Nitrate) (Lead iodide) yellow colour

iii) Yes, this is a double replacement reaction.

21. When the copper powder is heated, a black substance is formed. The hydrogen gas is passed over this heated material it turns brown. Why?

Ans. While heating copper powder, the oxygen is added to copper to form copper oxide which is black in colour. The oxidation reaction take place here.

$$2Cu + O_2 \xrightarrow{Heat} 2CuO$$

The hydrogen gas is passed over this heated material (CuO) the black coating on the surface turns brown and copper is obtained. Copper oxide is reduced to copper.

$$CuO + H_2 \xrightarrow{Heat} Cu + H_2O$$

22. What is oxidation reaction? Write an example.

Ans.The process in which a substances loses an electron (or gains oxygen) during a chemical reaction is called oxidation reaction.

Eg. $4Na(s) + O_2(g) \rightarrow 2Na_2O(s)$

23. Define reduction reaction. Write an example.

Ans. The process in which a substance gains an electron (or losses oxygen) during a chemical reaction is called a reduction reaction

Eg. $CuO(s) + H_2(g) \rightarrow Cu(s) + H_2O(l)$

24. Explain Redox reaction. Write two example.

Ans. A reaction in which one reactant undergoes oxidation whereas the other gets reduced during the course of reaction are termed as oxidation reduction reaction or redox Reaction.

Oxidation

Eg. $ZnO + C \rightarrow Zn + CO$

Reduction

Oxidation

$MnO_2 + HCl \rightarrow MnCl_2 + H_2O + Cl_2$

Reduction

25. Define corrosion. Write examples.

Ans. Corrosion is a process where the metal surfaces

are gradually eaten by the action of water, moisture or a chemical like acid.

Eg a. Rusting of iron
b. Black coating on silver
c. Green coating on copper

25. What is Rusting of Iron? What type of reaction take place in this reaction?

Ans. The iron metal is attacked by the substance around it such as moisture, acid etc. and get coated with a reddish brown powder on iron metal. This brown colour powder is known as ferrous oxide. It causes damage to the iron metal. It is an oxidation reaction.

$4Fe + 3O_2 + 2 \times H_2O \rightarrow 2Fe_2O_{3.X} H_2O$ (Rust)

27. What are the after effects of corrosion?

Ans. Corrosion causes damage to car bodies, bridge, iron railing, ship and all objects made of metal. Corrosion of iron is a serious problem.

28. How to prevent the corrosion?

Ans. The ways to prevent the corrosion are

a) Paint the metal: Paint the metal with any durable acrylic paint (do not use water soluble paint).
b) Keep away from moisture: Avoid contact with water or moisture. Make sure metals are dry.
c) Coat it with oil: Use of oil or grease reduces the chance of corrosion in metals.
d) Use stainless steel: Steel is an alloy of iron and zinc. Presence of zinc in iron decreases the oxidation.

29. Explain Rancidity.

Ans. Rancidity is the complete or incomplete oxidation or hydrolysis of fats and oils when exposed to air, light or moisture resulting in unpleasant taste and odour. It is an oxidation reaction.

Eg. When fried chips are kept outside for a long time it starts giving unpleasant smell.

30. What are the precautions to prevent rancidity?

Ans. The precautions are

i) Store the food in an air tight container, this keeps the food fresh for a long time.
ii) Store the food in refrigerator to keep it fresh for a long time.
iii) By adding antioxidants to foods containing fats and oils.
Eg. Vinegar added to pickles.
Vinegar is an antioxidants.
iv) By packing fat and oil containing food in nitrogen gas.
v) Storing food away from light.

31. Chips manufactures usually flush bags of chips with gas such as nitrogen. Why?

Ans. Chips manufactures usually flush bags of chips with nitrogen gas because this non-reactive gas prevent the food to come in direct contact with air.

32. What is an antioxidant?

Ans. Antioxidant is a substance which prevents oxidation, if added to food containing fats and oil. This substance is called antioxidant.

Eg. Vinegar added to pickle, Pizza, Ketchup.

NCERT SOLUTIONS

1. Why should a magnesium ribbon be cleaned before burning in air?

Ans. A magnesium ribbon be cleaned before burning in air because when magnesium is stored it react with oxygen or air to form magnesium oxide. This layer of magnesium oxide is quite stable and prevent further reaction of magnesium with oxygen

2. Write the balanced equation for the following chemical reactions.

i) Hydrogen + Chlorine → Hydrogen chloride
ii) Barium Chloride + Aluminium sulphate → Barium sulphate + Aluminium chloride
iii) Sodium+water → Sodium hydroxide + Hydrogen

Ans. i) Hydrogen + Chlorine → hydrogen chloride
$H_2 + Cl_2 \rightarrow 2HCl$
ii) Barium Chloride + Aluminum sulphate →Barium sulphate + Aluminum chloride
$3BaCl_2 + Al_2(SO_4)_3 \rightarrow 3BaSO_4 + 2AlCl_3$
iii) Sodium + Water →Sodium hydroxide + Hydrogen
$2Na + 2H_2O \rightarrow 2NaOH + H_2$

3. Write a balanced chemical equation with state symbols for the following reaction.

i) Solutions of Barium chloride and sodium sulphate in water react to give insoluble barium sulphate and the solution of sodium chloride.
ii) Sodium hydroxide solution (in water) react with hydrochloric acid solution in water to produce sodium chloride solution and water.

Ans. i) $BaCl_2(aq) + Na_2SO_4(aq) \rightarrow BaSO_4(s) + 2NaCl(aq)$
ii) $NaOH(aq) + HCl(aq) \rightarrow NaCl(aq) + H_2O(l)$

4. A solution of substance 'X' is used for whitewashing

i) Name the substance 'X' and write its formula.
ii) Write the reaction of the substance 'X' named in (i) above with water.

Ans: i) The substance 'X' is calcium oxide (lime).
Its chemical formula is CaO
ii) Calcium oxide react vigorously with water to form calcium hydroxide (slaked lime).

$CaO + H_2O \rightarrow Ca(OH)_2$
(Calcium oxide) (Water) (Calcium hydroxide)

5. Why is the amount of gas collected in one of the test tubes in activity 1.7 (electrolysis of water) double of the amount collect in the air? Name this gas?

Ans. Water (H_2O) contain two parts of hydrogen and one part of oxygen. So the amount of hydrogen and oxygen

produced during electrolysis of water is in 2:1 ratio. During electrolysis, since hydrogen goes to one test tube and oxygen goes to another hence the amount of gas collected in one of the test tube is double the amount collected in the other. The gas collected in double the amount is hydrogen and the other gas is oxygen.

6. Why does the colour of copper Sulphate solution change when an iron nail is dipped it?

Ans. When an iron nail is placed in a copper sulphate solution, iron displaces copper from the blue coloured copper sulphate solution forming light green coloured ferrous sulphate solution and copper metal.

$Fe(s) + CuSO_4(aq) \rightarrow FeSo_4(aq) + Cu(s)$

7 . Give an example of double displacement reaction other than the one given in Activity 1.10.

Ans. A double displacement reaction between the reactants lead nitrate and potassium iodide gives new substances - a yellow precipitate of lead iodide and potassium nitrate.

$Pb(NO_3)_2(aq) + 2KI(aq) \rightarrow PbI_2(s) + 2KNO_3(aq)$

8. Identify the substances that are oxidized and the substances that are reduced in the following reaction.

i) $4Na(s) + O_2(g) \rightarrow 2Na_2O(s)$

ii) $CuO(s) + H_2(g) \rightarrow Cu(s) + H_2O(i)$

Ans. i) Sodium (Na) is oxidized to sodium oxide as it gain oxygen and oxygen (O_2) gets reduced.

ii) Copper oxide (CuO) is reduced to copper (Cu) while hydrogen (H_2) get oxidized to water (H_2O).

9. What is a balanced chemical equations? Why should chemical equations should be balanced?

Ans. A chemical equation is balanced when the numbers of atoms of each type involved in a chemical reaction are same on both the reactant and product sides of the equation.

The chemical equations must always be balanced to satisfy the law of conservation of mass which states that 'Mass can neither be created nor destroyed in a chemical reaction'. This means that the total mass of the element presents in the products of a chemical reaction has to be equal to the total mass of the elements present in the reactant. Hence the number of atoms of each elements in the product must be equal to the number of atoms of these elements in the reactants.

10. Translate the following statement in to chemical equations and then balance them.

a. Hydrogen gas combines with nitrogen to form ammonia.

b. Hydrogen sulphide gas burns in air to give water and sulphur dioxide.

c. Barium chloride reacts with aluminum sulphate to give aluminum chloride and precipitate of barium sulphate.

d. Potassium metal react with water to give potassium hydroxide and hydrogen gas.

Ans. a) $3H_2 + N_2 \rightarrow 2NH_3$

b) $2H_2S + 3O_2 \rightarrow 2H_2O + 2SO_2$

c) $2BaCl_2 + Al_2(SO_4)_3 \rightarrow 2AlCl_3 + 3BaSO_4$

d) $2K + 2H_2O \rightarrow 2KOH + H_2$

11. Balance the following chemical equation

a) $HNO_3 + Ca(OH)_2 \rightarrow Ca(NO_3)_2 + H_2O$

b) $NaOH + H_2SO_4 \rightarrow Na_2SO_4 + H_2O$

c) $NaCl + AgNO_3 \rightarrow AgCl + NaNO_3$

d) $BaCl_2 + H_2So_4 \rightarrow BaSO_4 + HCl$

Ans a) $2HNO_3 + Ca(OH)_2 \rightarrow Ca(NO_3)_2 + 2H_2O$

b) $2NaOH + H_2SO_4 \rightarrow Na_2SO_4 + 2H_2O$

c) $NaCl + AgNO_3 \rightarrow AgCl + NaNO_3$

d) $BaCl_2 + H_2SO_4 \rightarrow BaSO_4 + 2HCl$

12. Write the balanced chemical equations for following reactions.

a) Calcium Hydroxide + Carbon dioxide →Calcium Carbonate + water

b) Zinc + Silver nitrate → Zinc nitrate + Silver

c) Aluminum + copper chloride → Aluminum chloride + copper

d) Barium chloride + Potassium sulphate → Barium Sulphate + Potassium chloride

Ans a) $Ca(OH)_2 + CO_2 \rightarrow CaCO_3 + H_2O$

b) $Zn + 2AgNO_3 \rightarrow Zn(NO_3)_2 + 2Ag$

c) $2Al + 3CuCl_2 \rightarrow 2AlCl_3 + 3Cu$

d) $BaCl_2 + K_2SO_4 \rightarrow BaSO_4 + 2KCl$

13. Write the balanced chemical equations for the following and identify the type of reactions in each case.

a) Potassium bromide (aq) + Barium iodide (aq) → Potassium iodide (aq) + Barium bromide (s)

b) Zinc carbonate (s) → zinc oxide(s) + carbon dioxide (g)

c) Hydrogen (g) + Chlorine(g) → Hydrogen chloride(g)

d) Magnesium (s) + Hydrochloric acid (aq) →Magnesium chloride(aq) + Hydrogen(g)

Ans. a) $2KBr(aq) + BaI_2 \rightarrow 2KI(aq) + BaBr_2(s)$

Double displacement reaction and precipitation reaction.

b) $ZnCO_3(s) \rightarrow ZnO(s) + CO_2(g)$, Decomposition reaction.

c) $H_2 + Cl_2(g) \rightarrow 2HCl(aq)$, Combination reaction

d) $Mg(s) + 2HCl(aq) \rightarrow MgCl_2(s) + H_2(g)$, Displacement reaction.

14. What does mean by exothermic and endothermic reactions? Give examples.

Ans. Reactions in which heat is released along with the formation of products are called exothermic reactions.

Eg. Burning of natural gas.

$CH_4(g) + 2O_2(g) \rightarrow CO_2(g) + 2H_2O(g) + Heat$

Reactions in which energy is absorbed are known as endothermic reactions.

Eg. $2AgBr(s)$ sunlight $2Ag(s) + Br_2(g)$

15. Why is respiration considered an exothermic reaction? Explain.

Ans. Food that we eat includes carbohydrates, proteins,

Vitamin etc. During digestion carbohydrates are broken down into simpler substance called glucose. Glucose combines with oxygen in the cells of our body to form carbon dioxide, and water along with energy. This reaction is called respiration. Since energy is released during this process, respiration is an exothermic reaction.

$C_6H_{12}O_6$ (aq) +6O_2(g) → 6CO_2(aq) + 6H_2O(l) + energy

16. Why are decomposition reactions called the opposite of combination reactions? Write equation of these reactions.

Ans. In the decomposition reaction, a single substance decomposes to give two or more substances. Whereas in a combination reaction two or more substance combine to form a new single substance and hence decomposition reactions are opposite of combination reactions.

Decomposition reaction

Eg. $CaCO_3(s) \xrightarrow{heat} CaO(s) + CO_2(g)$

Combination reaction

C(s) +O_2(g) → CO_2

17. Write one equation each for decomposition reactions where energy is supplied in the form of heat light or electricity.

[Previous question CBSE 2018]

Ans. Heat

$$Ca\ CO_3(s) \xrightarrow{heat} CaO(s) + CO_2(g)$$

Light

$$2AgBr(s) \xrightarrow{sunlight} 2Ag(s) + Br_2(g)$$

Electricity

$$2H_2O(I) \xrightarrow{electricity} 2H_2(g) + O_2(g)$$

18. What is the difference between displacement and double displacement reactions? Write equations of these reactions.

Ans. A displacement reaction is a chemical reaction in which a more reactive element displaces a less reactive element from its salt solution.

Eg. Fe + $CuSO_4$ → $FeSO_4$ +Cu

In this reaction, one displacement is taking place. Fe is displacing Cu.

Double displacement reaction is a chemical reactions in which there is an exchange of ions between the reactants to give new substance. There are two displacement taking place in a double displacement reaction.

Eg: 3$BaCl_2$ + Al_2 $(SO_4)_3$ → 2$AlCl_3$ + $BaSO_4$

In this reaction two displacement are taking places Ba is displacing Al and Al is displacing Ba.

19. In the refining of silver the recovery of silver from silver nitrate solution involved displacement by copper metal. Write down the reaction involved.

Ans. 2$AgNO_3$(aq) + Cu(s) → $Cu(NO_3)_2$ + 2Ag(s)

20. What do you mean by a precipitation reaction? Explain by giving examples.

Ans . Any reaction that produces an insoluble solid (precipitate) can be called a precipitation reaction.

These insoluble salt separate out from the solution and settle down as precipitate.

Eg. When aqueous sodium sulphate solution and aqueous barium chloride are reacted aqueous solution of sodium chloride and white precipitate of Barium sulphate are formed

$NaSO_4$(aq) +$BaCl_2$(aq) →

2NaCl(aq) +$BaSO_{4(white\ ppt)}$

21. Explain the following terms of gain or loss of oxygen with two examples each.

a. Oxidation

b. Reduction

a. Oxidation: It is the gain of oxygen by a substance in a reaction.

eg: When magnesium is burned in air magnesium oxide is formed

2Mg + O_2 → 2MgO

Here magnesium is oxidized to magnesium oxide. It has gain oxygen.

Eg(2) When copper oxide is heated with hydrogen, copper metal and water are formed.

CuO + H_2 →Cu + H_2O

Here, H_2 is getting oxidized to H_2O it has gained oxygen.

Reduction: It is the loss of oxygen by a substance in a reaction.

Eg. When zinc oxide is heated with carbon, zinc metal and carbon monoxide are formed.

ZnO + C → Zn + CO

ZnO getting reduced to Zn. It has lost oxygen

Eg. When copper oxide is heated with hydrogen, copper metal and water are formed.

CuO + H_2 → Cu + H_2O

Here CuO is getting reduced to Cu. It has lost oxygen .

22. A shiny brown coloured element 'X' on heating in air becomes black in colour. Name the element 'X' and the black coloured compound formed.

Ans. The shiny brown coloured element 'X' is copper and the black coloured compound is copper oxide (CuO) the chemical reaction is

2Cu + O2 $\xrightarrow{heat}$ 2CuO

23. Why do we apply paint on iron articles?

Ans . We apply paint on iron articles to avoid their rusting. When a coat of paint is applied to the surface of an iron article, it stop the contact of air and moisture with the iron metal and hence no rusting take place.

24. Oil and fat containing food item are flushed with nitrogen. Why?

Ans. When food items containing fat and oil are kept for a long time, they get oxidized by aerial oxidation and become rancid and their smell and taste change. Food items containing oil and fat are flushed with nitrogen to prevent rancidity of oil and fats. Nitrogen is an inert gas and prevent the oxidation of oil and fats.

25. Explain the following terms with one example each.

a) Corrosion

b) Rancidity

a) Corrosion: Corrosion is a process where the water or moisture on the surface of the metal oxidizes with atmospheric oxygen .

eg. Rusting of iron

Black coating on silver

b) Rancidity: When food items containing fat and oil are kept for a long time, they get oxidized and their smell and taste change. This process is known as Rancidity.

Eg. When butter kept in open for long time tastes and smell bad because of rancidity.

EXTRA QUESTIONS AND ANSWERS

1. A student added a few pieces of aluminum metal to two test tubes A and B containing aqueous solution of iron sulphate and copper sulphate. In the second part of her experiment, she added iron metal to another test tubes C and D containing aqueous solutions of aluminum sulphate and copper sulphate.

In which test tube or test tubes will she observe colour change? On the basis of this experiment, state which one is the most reactive metal and why? [previous question CBSE syllabus 2018)

Ans: The reaction occurs when student added piece of aluminium metal to two test tube A and B

Test tube A: $2Al + 3FeSO_4 \rightarrow Al_2(SO_4)_3 + 3Fe$

Test tube B: $2Al + 3CuSO_4 \rightarrow Al_2(SO_4)_3 + 3Cu$

The reaction occurs when student added piece of iron metal in test tube C and D

Test tube C: $2Fe + Al_2(SO_4)_3 \rightarrow$ No Reaction

Test tube D: $Fe + CuSO_4 \rightarrow FeSO_4 + Cu$

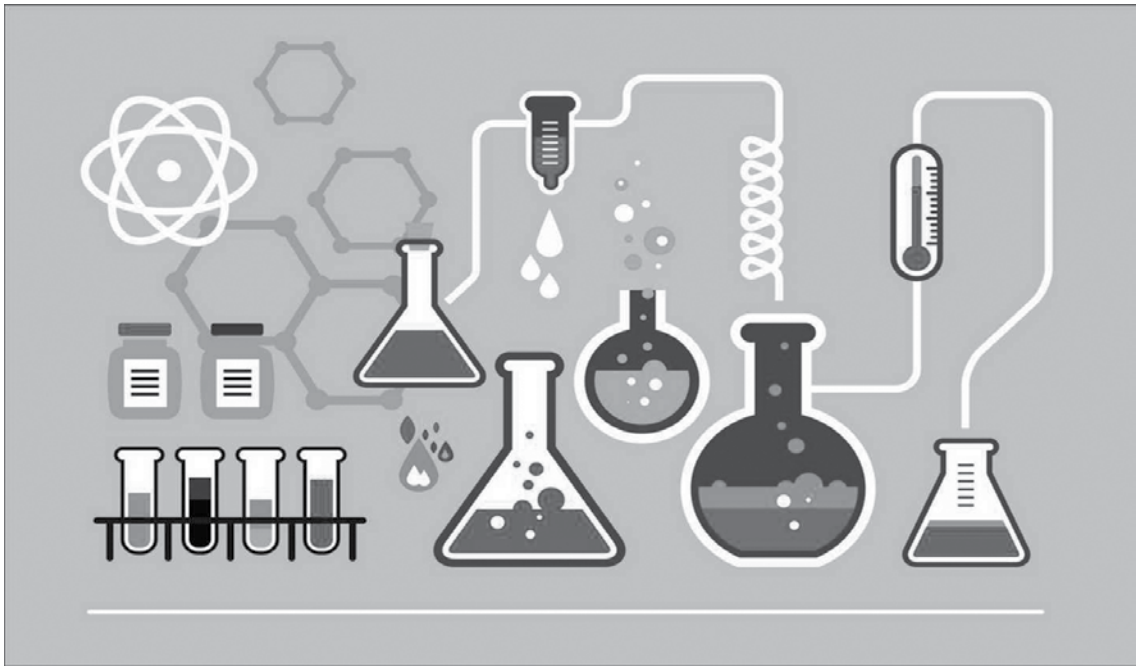
The colour change can be observed in Test Tube A, B, D, no reaction will be observed in test tube C because Al is more reactive than iron.

2. What is observed when a solution of sodium sulphate is added to a solution of barium chloride taken in a test tube? Write equation for the chemical reaction involved and name the type of reaction in this case. [Previous questions CBSE syllabus 2018]

Ans: When sodium sulphate is added to barium chloride, it gives white precipitate of barium sulphate which is insoluble in water. The reaction also creates sodium chloride which remains dissolved in water and so cannot be seen.

It is double displacement reaction.

$Na_2SO_4 + BaCl_2 \rightarrow 2NaCl + BaSO_4$



INFO JUNCTION

February 01, 2020

MOHAMMED ALLAWI

One of the former communication ministers of Iraq, Mr. Mohammed Allawi was appointed as the Prime Minister of the country. Allawi has been appointed the Prime Minister of the Country amidst long protests that has so far killed 600 in the country.

February 25, 2020

MOHAMMED HOSNI MUBARAK

The Egypt ruler Mohammed Hosni Mubarak died at the age of 91. He served as the President of Egypt between 1981 to 2011.

March 21, 2020

SATYARUP SIDDHANTA

The Indian Mountaineer Satyarup Siddhanta has entered 'Limca Book of Records'. He has set the record of becoming the first Indian to climb the highest volcano in the world. He already holds Guinness Book of World Records, India Book of Records, Asia Book of Records, British Book of records and Champion Book of Records.

March 28, 2020

EARTH HOUR

Since 2007, every year millions of people participate in the campaign called "Earth Hour" in March. This year, it was celebrated on 28 March 2020. It is a symbolic movement of "Lights OFF" to save the environment. The event is organized by the World wide Fund. The event was first started in Sydney, Australia. The aim of marking Earth Hour is to give attention towards global warming, climate change and loss of biodiversity. During the one-hour campaign, all over the world switch off lights and electronic items between 8:30 PM to 9:30 PM. The Earth Hour is held every year on the last Saturday of March.

March 29, 2020

AIR VICE MARSHALL CHANDAN SINGH RATHORE

The Mahavir Chakra recipient Air Vice Marshall Chandan Singh Rathore died at his Jodhpur residence. His services during 1962 war and 1971 war were impeccable. He was honored with Mahavir Chakra for the same.

March 30, 2020

NASA ANNOUNCES SUNRISE MISSION

NASA announced Sun Radio Interferometer Space Experiment (SunRISE) mission. The mission is to study about how sun creates Giant Solar Particle Storms. The SunRISE mission will provide information on how the Sun's radiation affects the space environment and to understand the working of the solar system. The study will also aid future astronauts mission.

March 30, 2020

RAJASTHAN STATEHOOD DAY

Rajasthan celebrates its Statehood Day on March 30 every year.
Popularly known as "Land of the Kings", the day is also called "Rajasthan Day". This year, the state was silent due to the lock down in the country. Usually there were radiant and invigorating events held all across

April 7, 2020

WORLD HEALTH DAY

April 7 is marked as the World Health Day every year. The day is marked to celebrate the work of midwives and nurses for their role in keeping the world safety and healthy. This year, 2020, has celebrated as International Year of Nurses andMidwives. The World Health Day is marked by World Health Organization along with several other organizations. The theme of the World Health Day is selected by WHO. Theme of 2020: Support Nurses and Midwives.

APRIL 9, 2020

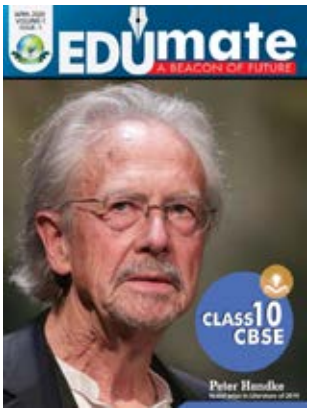
INDIAN RAILWAY AGAINST COVID 19

Apart from converting its coaches into hospital beds, the Indian Railways has also launched isolation wards. Around 3,250 coaches have been converted into isolation wards. It has recruited 2,500 temporary doctors and 35,000 paramedic staffs. Around 5,000 beds have been identified for treatment in railway hospitals.

ENSURE YOUR COPIES OF

EDUmate

A BEACON OF FUTURE



Subscription Rates - Annual

Edumate – A Beacon of Future - **Class – X** **(4 Issues) – Rs. 900**

Bulk Subscription Rate- Annual (Minimum 25 copies)

Edumate – A Beacon of Future- **Class – X** **(4 Issues) – Rs. 800**

Subscription Rate - Single Issue

Edumate – A Beacon of Future- **Class – X (1 Issue) – Rs. 250/ one copy**

YEARLY SUBSCRIPTION FORM

Name : .....

Address :.....

.....

.....Pincode.....

Phone No..... e-mail : .....

School Name & Address:.....

.....

I would like to subscribe Edumate for the year 2020 and hereby sending Rs. ..... as D.D. / Cheque in favour of Edumate Publications, payable at Delhi toThe Manager, Edumate Publications, 29/B, Pocket A/3,MayurVihar Phase – III, New Delhi –110096, for Annual Single subscription ☐ , Annual Bulk subscription ☐ , Single subscription Issue number..... ☐

Student's signature **Parent's signature**

While ordering kindly mention the address to which the copy is to be sent and your phone number in the covering letter.

Students / Teachers can send your Literary works (Articles/ Poems/Quiz etc.) for publishing in Edumate.

JONCE PUBLICATIONS

JONCE
PUBLICATIONS

ENGLISH GRAMMAR

GENERAL KNOWLEDGE

VALUE EDUCATION

CURSIVE WRITING

HINDI WRITING

ENGLISH CONVERSATION

DRAWING

PRE-PRIMARY

BOOKS

JONCE PUBLICATIONS

13/B, Pocket A-3, Mayur Vihar Phase - III, Delhi-110 096
Ph: +91- 9899855258, 8527766236
E-mail: joncepublications@gmail.com