Chemical reaction:- breaking up of bond in reactants and form new bond in products.

Thermal decomposition reactions

It is a reaction which compound is broken up into simple components by heat.

$NaN_3 \longrightarrow 2Na + 3N_2$
$2HgO \longrightarrow 2Hg + O_2 \uparrow$
$Cu(OH)_2 \longrightarrow CuO + H_2O \uparrow$
$CuCO_3 \longrightarrow CuO + CO_2 \uparrow$
$CuSO_4 \longrightarrow CuO + SO_3 \uparrow$
$2NaNO_3 \longrightarrow 2NaNO_2 + O_2 \uparrow$

A) Simple substitution reactions

They are reactions where one element substitutes another less active one.

The chemical activity series

It is the arrangement of metals in descending order according to their chemical activity.

$2Na + 2H_2O \longrightarrow 2NaOH + H_2 + heat$

$Zn + 2HCl \longrightarrow ZnCl_2 + H_2$

$2Al + 6HCl \longrightarrow 2AlCl_3 + 3H_2$

$Mg + CuSO_4 \longrightarrow MgSO_4 + Cu$ Red p.p.t

***B) Double substitution reaction*:**

It is a reaction where double exchange occurs between the ions of two compounds

Neutralization reaction a reaction between acid and an alkali to form salt and water.

$NaOH + HCl \longrightarrow NaCl + H_2O$

$Na_2CO_3 + 2HCl \longrightarrow 2NaCl + H_2O + CO_2$ **carbon dioxide turbid lime water.**

- When add sodium chloride to silver nitrate, a white precipitate of silver chloride is formed.

$NaCl + AgNO_3 \longrightarrow NaNO_3 + AgCl \downarrow$

1- Oxidation and Reduction $H_2 + CuO \longrightarrow Cu + H_2O$

Oxidation: A process causes increase of oxygen percentage and the decrease of hydrogen.
Oxidation: A chemical process where the atom loses an electron or more

Reducing agent: It is the substance which takes oxygen or gives hydrogen
Reducing agent: It is the substance which loses an electron or more.

Reduction: process causes decrease of oxygen percentage or the increase of hydrogen.
Reduction: A chemical process where an atom gains an electron or more.

Oxidizing agent: It is the substance which gives oxygen or takes hydrogen away
Oxidizing agent: It is the substance which gains an electron or more.

Speed of chemical reactions

- **Very fast reactions:** **fireworks**. - **Relative slow reactions:** **oil** react with **caustic soda**
- **Very slow reactions:** **Iron rusting**. - **Too slow reactions:** **petroleum oil formation**.

$2N_2O_5 \rightarrow 4NO_2 + O_2$

The speed of chemical reaction

is the change in the concentration of reactants & products (resultants) in a unit time.

Measuring the speed of chemical reaction:

measured by rate of **disappearance** of reactants or rate of **appearance** of product.

$NaOH + CuSO_4$ blue $\rightarrow Na_2SO4 + Cu(OH)_2\downarrow$ blue p.p.t

Factors affect the speed of chemical reactions:

1- The nature of reactants: a- kind of bonds

Items of comparison	Covalent compounds	Ionic compounds
The speed of reaction	Slow(molecules)	Fast (ions)

$NaCl + AgNO_3 \rightarrow NaNO_3 + AgCl$ Fast reaction Bec. It happens between ions.

b- Surface area. Due to increase number of reactant molecules

$Fe + 2HCl \rightarrow FeCl_2 + H_2\uparrow$ increase surface area of iron fillings and nickel fillings

The concentration of reactants: Due to increase of collision between molecules.

- $Mg + 2HCl \rightarrow MgCl_2 + H_2$

The temperature of reaction. Due to increase of collision between molecules

A catalyst is a substance change rate (speed) of chemical reaction without change.

Positive catalyst speed up reactions while **negative catalyst** decrease speed reactions.

Positive catalytic reactions: chemical reactions which catalyst increases their speed.

Negative catalytic reactions: chemical reactions which catalyst decreases their speed.

Manganese dioxide as catalyst increase decomposition of hydrogen peroxide.

$2H_2O_2 \longrightarrow 2H_2O + O_2\uparrow$

- **Enzymes** is chemical substances produced by the body acts as a catalyst.

-Oxidase enzyme in the sweet potato speeds up the breaking of hydrogen peroxide.

Catalytic converter: A metallic can in modern cars to treat harm gases from car engine.

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Hormone chemical substance that control and regulate vital activities and functions.
Endocrine glands ductless glands that secrete hormones directly in blood.

- **Target cells** the cells that hormones affect, they located away from endocrine gland
- **Hormone disorder** increase or decrease in hormone gland secretion, it **doesn't work properly**.

1. **Pituitary gland** below brain **master gland** bec. it secretes hormones to regulate other glands
   - It secretes **growth hormone** **Dwarfism**:. Decrease of secretion in growth hormone.
   - **Gigantism**: Increase of secretion in growth hormone.

2- Thyroid gland in front of neck. - on sides of trachea.

- It secretes **Thyroxin hormone** to liberate energy from **food assimilation**.
- It secretes **calcitonin hormone** that control **level of calcium** in blood
- **1- Simple goiter: Decrease of secretion in thyroxin hormone - Lack of Iodine.**
- **2- Exophthalmic goiter: Increase of secretion in thyroxin hormone**

3- Adrenal gland: top of kidney.

It secretes **Adrenalin hormone** stimulates body's organs to respond to emergencies

4- Pancreas gland

1 –Insulin hormone: It reduces blood sugar level by storing glucose sugar in liver as glycogen

2-Glucagon hormone: It raises blood sugar level by change glycogen into glucose sugar.

Diabetes: due to decrease in secretion of insulin hormone.

5- Reproductive glands

- **The two testes: testosterone: produces male secondary sex characters.**
- **The two ovaries:**

1-Estrogen: produces female secondary sex characters.

2-Progesterone: growth of endometrium (lining of uterus).

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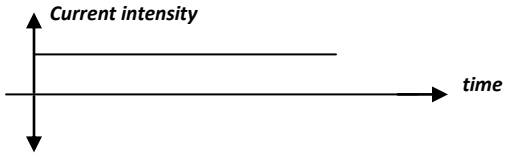
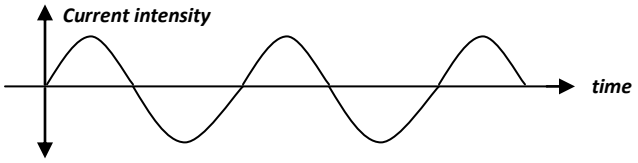
1-Chemical reactions: *They change the chemical energy into electric energy.*

Types of the electric current

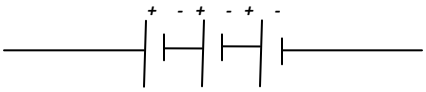
1)-Direct current	2)-Alternating current
1-It has Constant intensity and direction. 2-produced from electric cells 3-cannot be changed into alternating current. 4-it can be transmitted for short distances. 5-it is used in electroplating processes	1-it is variable directions & intensity 2-produced from electric generator 3-can be changed into a direct current. 4-it can be transmitted for long distances 5-it is used in lighting, houses & in operating electric appliances

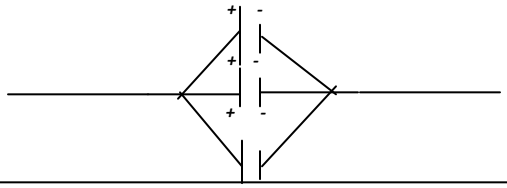




Methods of connecting the cells

Series Connection	Parallel Connection
1-It is connected positive pole of first cell to negative pole of Second by a copper wire.	1- it is connect positive poles of all cells together &negative poles of all cells by a copper wire.
2-(emf) of a group of different cells	2-group of similar cells
$E_{battery} = E_1+E_2+E_3$.....	$E_{battery} = E_1$
Similar cells: $E_{battery} = n \times E_1$	
3-used to obtain high (em.f)	3-used to obtain low (e.m.f)





Mob.: 01003903027 Mr.ELshazly: https://www.facebook.com/swalWajabaQuestionAnswer
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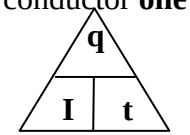
Physical properties of electric current

Electric current: It's the flow of electric negative charges (electrons) through a conductor.
Electric current intensity (I): quantity of electric charges flowing through a conductor in one second .

- Measuring unit of current intensity: **Ampere** * Measuring unit of quantity of electricity: **Coulomb**. * Measuring unit of time: **Second**.

Ampere: It's the electric current intensity passing through a circuit when quantity of charge of **one coulomb** passes through conductor **one second**.
Coulomb: It's the quantity of charge transferred by a constant current intensity **one ampere** in **one second**.



Ammeter: device used to measure current intensity and **connected in** the circuit in **series**.

Electric potential of conductor: state of electric conductor that shows transfer of electricity from or to it when it is connected to another conductor.
Potential difference: value of work done to transfer a quantity of charge (1 coulomb) between the two poles of this conductor.

- Measuring unit of potential difference: **Volt.** * Measuring unit of work: **Joule**.

Volt: It's the potential difference across a conductor on doing a work of **one joule** to transfer a quantity of charge of **one coulomb**.

Electromotive force: potential difference between the two poles of the battery when the electric **circuit is open**.

- Measuring unit of electromotive force (E.M.F): **Volt**.

Voltmeter: Used to measure of potential difference and electromotive force and **connected in parallel** between the two terminals of the conductor.

- **Electric transformers: device used to reduce potential of electric source.**

Electric resistance: It's the opposition (obstruction) that the electric current faces during its passing through a conductor.

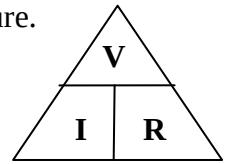
- Measuring unit of resistance: **Ohm**. * **Ohmmeter:** device used to measure resistance.

Ohm: resistance between two points of conductor when potential difference of **one volt** to produce current of **one ampere** in conductor

- **Types of electric resistance:** Constant resistance – Variable resistance **(Rheostat)**
  Rheostat: device used to control electric current intensity and potential difference.
  Rheostat: resistance can change value to control current intensity and potential difference.
- **Rheostat: when wire length increases, the resistance increases and current intensity decreases.**

Ohm's law: The electric current intensity passing through a conductor is **directly proportional** to potential difference across it at constant temperature.

- **R = V / I**



Ohm: It's resistance of a conductor allows passing electric current intensity of **one ampere** when the potential difference is **one volt**.
Ampere: It's the current intensity passing through a conductor whose resistance is **one ohm** and the potential difference is **one volt**.
Volt: It's the potential difference across conductor whose resistance is **one ohm** and current intensity is **one ampere**.

What happen: fixed resistance is burnt // reading of ammeter = 0 - voltmeter read E.m.f of battery.

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Lesson (3): Radioactivity and Nuclear Energy

- **Nuclear Energy stored** in nucleus and **originated** due to **Nuclear binding force**
- **Nuclear binding force**: force that binds the nucleus components together and overcome repulsion force between positive protons.
- **Henri Becquerel** discovered: Radioactivity. He discovered: Emission of unseen rays from Uranium element which have ability to penetrate solid objects.

- **Radioactive elements:** elements nuclei have **number of neutrons more than number required for its stability** (unstable = they've excess energy).
- **Ex**: Radium – Rubidium – Cesium – Selenium – Polonium – Uranium – Zirconium.

- **Natural Radioactivity:** decay of nuclei of Radioactive elements in an attempt to achieve a **more stable** composition

- **Artificial radioactivity: radiation of nuclear energy from nuclear reactions as nuclear reactor or nuclear bombs.**
  Artificial radioactivity: 1- Nuclear reactors (safe uses): can be controlled. **2-** Nuclear bombs (military uses): can't be controlled.

	Field	Use
Peaceful uses of nuclear energy	**Medical field**	**Treat diseases like cancer**
	Agricultural field	**Eliminate pests and improve some plant races**
	Drilling field	**For drilling of petroleum and underground water.**
	Space exploration field	**nuclear fuel for rockets.**
	Industrial field	**Convert sand to silicon sheets to used in computer – discover industry defects.**
	Electricity generation field	**generate electricity.**

- **Radiation Pollution:** increase of the amount of radiation in the environment.
- **Sources of radiation pollution: 1- Natural radiation sources**: **A-** Natural radioactive elements. **B- Cosmic radiation** comes from outer space.
  2- Artificial radiation sources: nuclear bombs - nuclear reactors
- **GR** Explosion of the Russian Chernobyl reactor: - Due to error in operation.
- The elements were found in food after Chernobyl accident are: **Iodine** and **Cesium** isotopes
- **Isotopes:** atoms of the **same element** with the **same number of protons** and **different** number of **neutrons**.

  1- Effects of **large dosage of radiation for short time:** damage: Bone marrow – Spleen - Digestive system - Central nervous system.

  2- Effects of **small dosage of radiation for long time:**
  A- Physical effects change appears on organisms due to radiation is skin cancer.
  B- Genetic effects changes in **sex chromosomes** composition which result in abnormal birth.
  C- Cellular effects change in **cell composition** make destroying cells

- **Sievert:** measuring unit for radiation. **20 m** Sievert per year for radiologists - **1 m** Sievert for public.
- **Means of protection from radiation pollution:**
  1- Radiologists should wear radiation protective clothes. 2- Radioactive wastes away from underground water and volcanoes.
  3- Burying nuclear wastes according to radiation power.. 4- Making laws for nuclear station to cool hot water before throw in seas.

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Genetics:

Science research hereditary traits transmission from generation to another by studding similarities & differences between parents & offspring.

Kinds of traits	Hereditary traits	Acquired traits
	Traits are transmitted from one generation to another	Traits aren't transmitted from one generation to another.
	Ex: Hair color, Eye color, Skin color & Blood groups.	Ex: Playing football, Writing and Swimming.

- **Gregor Mendel:** first scientist show how traits transfer from one generation to another. He performed his experiments using (pea plant).
  - **(G.R): Mendel used pea plant for reasons:**

1- Easy planted and grows fast.
2- Short life cycle.
3- Hermaphrodite flower, so it can be self-pollination.
4- Artificially pollinated by human.
5- Producing large number of plants in a generation.
6- It is has several pairs of contrasting traits.

<u>Mendel study the inheritance of one pair of contrasting traits</u>

GR: Mendel make pea plant self-pollinate for several generations. -- To be sure of purity of this trait.
GR: Mendel removed the stamen from flower of plant before anther mature. - To prevent self-pollination.
GR: Mendel covered stigma of pistils of pea plant on studying traits. - To prevent cross-pollination.

* **Principle of complete dominance:** appearance of **dominant trait** in first generation when two individuals crossed carrying pure traits.
***Gametes:** reproductive cells carry hereditary traits from parents to offspring.

* **Gene:** part of (DNA), responsible for appearance of hereditary traits.

* **Hybrid individual:** carries different (contrasting) pair of genes (factors) one is dominant and other is recessive.

* **Pure individual:** carries similar pair of genes either dominant or recessive traits.

Types of traits

Dominant traits	Recessive traits
- Pure or hybrid. - Always appears - Appears with ratio 100% in first generation and 75% in second - Represented by Capital letter	- Always pure. - Appears only if two similar factors for recessive trait. - Disappears in first generation and appears with ratio 25% in second. - Represented by small letter

- Scientist **Johansen** used the term **gene** instead of hereditary factor.

Dominant gene: The gene appears with dominant or recessive gene.

Recessive gene: The gene its effect disappears when exists with another gene. (appear only with recessive gene)

What happen: The presence of dominant gene with a recessive gene. – dominant trait appears

* **<u>Law of segregation of factors (Mendel's 1st law):</u>** If two pure individuals of one pair in different traits crossed only dominant trait appears in first generation and two traits appear in second generation at ratio (3:1)

GR: Mendel's first law is known as law of segregation - due to separate the 2 trait factors in formation of gametes.

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Note: If mating produces 100% hybrid (parents is pure dominant and recessive trait)
If mating produces 50% hybrid : 50% recessive (1:1) (parents is hybrid dominant and recessive trait)
If mating produces 75% dominant : 25% recessive (2 parents are hybrid trait)

***Law of independent assortment of factors (Mendel's 2nd law):** If two individuals are different in two pairs or more contrasting traits crossed the trait of each pair is inherited independently and appears in second generation at ratio of (3:1)

Chemical structure of nucleic acid (DNA)

- Chromosomes consist of nucleic acid (DNA) and protein.
- DNA (nucleic acid) carry hereditary (genetic) traits
- DNA consists of small parts called **Genes** - Genes consists of small units called **nucleotides**.

* **Genes:** part of (DNA), responsible for appearance of hereditary traits.

The scientists Watson and Crick make a model of DNA molecule (two strands coiled forming a double helix shape)
The scientists Badel and Tatum discovered how genes control traits they received Nobel prize.

- **Gene** gives **Enzyme** make **chemical reaction** to make **protein** to show **hereditary trait**.
- **Enzyme:** make a chemical reaction to produce protein.
- **Human genome:** genetic map shows the complete set of genes on human chromosomes.

Deficiency in vitamin (A) cause malnutrition and lead to **losing of sight Bec.** Rice doesn't contain **carotene**
Modifying genes of rice contains carotene to form vitamin (A).

In plants			In human	
Dominant	**Recessive**		**Dominant**	**Recessive**
Red flower	White flower		Curly & black hair	Straight & light hair
Side flower	End flower		Wide & Brown eyes	Narrow & Colored eyes
Yellow seed	Green seed		Ability to roll tongue	Inability to roll tongue
Smooth seed	Wrinkled seed		Free ear lobe	Attached ear lobe
Tall stem	Short stem		Dimples	No Dimples
Green pod	Yellow pod		No Freckles	freckles
Swollen pod	Sinuous pod			

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March Revision

Mr. Ahmed Elbasha

(1) Write the scientific term :

1) A chemical process through which the atom loses one electron or more. (.....)

2) A chemical process which decreases oxygen percentage in the substance (.....)

3) The change in the concentration of the reactants and the products in a unit time. (.....)

4) The enzyme which is found in sweet potato and accelerates the decomposition rate of hydrogen peroxide (.....)

5) The metallic can exists in most modern cars to treat the harmful gases emitted from the engine. (.....)

6) A substance which changes the rate of chemical reaction without being changed. (.....)

7) They are chemical substance produced by the body of living organism act as catalysts that increase the speed of biological reactions. (.....)

8) The breaking up of bonds in reactants molecules and formation of a new bonds in the products molecules in the reaction. (.....)

9) The reaction between an acid and an alkali to give salt and water (.....)

10) Chemical reactions in which an element substitutes another one. (.....)

11) A chemical process which increase oxygen percentage in the substance. (.....)

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12) Chemical reactions in which a catalyst speeds up their rate. (.....)

13) It is a reaction where double substitution occurs between the ions of two compounds to form two new compounds. (.....)

14) The substance which loses one or more electrons in a chemical reaction. (.....)

15) Chemical compound which is resulted from the reaction of acid with alkali. (.....)

16) The change in the concentration of the reactants and resultants at a unit time. (.....)

17) A chemical process in which the atom loses an electron or more. (.....)

18) The breaking up of bonds in reactant molecules and the formation of new bonds in the products molecules. (.....)

19) The material which increases the speed of reaction without being changed. (.....)

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✸(2) Choose the right answer:

1.The reaction of oil with caustic soda is one of the ..... reactions.

a. very fast b. relatively slow c. very slow

2.On heating red mercuric oxide, it decomposes into .....

a. oxygen. b. mercury. c. oxygen and mercury. d. no correct answer.

3.At the beginning of the reaction the percentage of the reactants concentration equal

a. 100% b.0% c. 50% d. no correct answer

4.By adding silver nitrate solution to sodium chloride solution, a ..... precipitate is formed

a. black b. white c. blue d. brown

5.At the end of the chemical reaction, the concentration of the reactants is .....

a. zero % b. 25% c. 50% d. 100%

6.The substance which change the rate of the reaction without being changed is known as .....

a. oxidizing agent. b. active agent. c. catalyst. d. reducing agent.

7.All the following elements replace hydrogen of the diluted acid except .....

a. Al b. Zn c. Au d. Sn

8.When magnesium replaces copper in a solution of one of its salts, a ..... precipitate is formed.

a. black b. green c. red d. blue

9.Oxidization is a chemical process which increases ..... percentage in substance.

a. hydrogen b. oxygen c. helium d. fluorine

10.A reaction between an acid and an alkali to from salt and water is known ..... reaction.

a. reduction b. neutralization c. simple substitution

11.Sodium replaces the following metals in their salt solutions except for .....

a. copper. b. potassium. c. magnesium. d. zinc.

12.Sweet potato includes oxidase enzyme which helps in decomposition of ..... faster.

a. hydrogen chloride b. sodium chloride
c. hydrogen peroxide d. sodium carbonate

13.Air bag contains sodium .....

a. sulphate. b. azid. c. oxide. d. carbonate

14.When hydrochloric acid reacts with sodium carbonate, then the reaction produces gas which .....

a. turbid limewater. b. bums with a pop sound.
c. increases ignition. d. its colour is red brown.

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15.Magnesium element is considered more active than .....element.

a. calcium b. potassium c. zinc d. sodium

16.When a sodium atom loses an electron from its outer most energy level so it .....

a. oxidized only. b. reduced only.
c. becomes reducing agent only. d. oxidized and becomes reducing agent.

17.The reaction : $Cl_2 + 2e^- \rightarrow 2Cl^-$, represent .....process.

a. oxidation b. reduction c. decomposition d. substitution

18.In adding silver nitrate solution to sodium chloride solution, ...precipitation is formed from silver chloride.

a. red b. blue c. black d. white

19.The most active metal in the chemical activity series is .....

a. copper. b. sodium. c. hydrogen. d. aluminum.

20.Thermal decomposition of copper carbonate gives .....

a. copper+ water. b. copper+ carbon dioxide.
c. copper oxide+ carbon dioxide. d. copper oxide+ water vapor.

21.White sodium nitrates decompose by heat into ..... and oxygen.

a. sodium nitrite b. nitrogen c. sodium oxide d. ammonia

22.The reaction of oil with caustic soda is considered as reaction .....

a. relatively fast. b. relatively slower.
c. takes several months. d. takes several years.

23.Clear lime water turbid on passing ..... gas through it.

a. nitrogen dioxide b. suphur dioxide
c. carbon dioxide d. (a and b) are correct

24.The neutralization reaction occurs between .....

a. metal and non-metal. b. acid and salt.
c. copper and carbon. d. acid and alkali

25.When magnesium replaces copper in its salt solution, a ..... precipitate is formed.

a. black . b. red c. reddish brown

26.All the following metals replace hydrogen of acid except .....

a. potassium. b. magnesium. c. silver. d. zinc.

27.From compounds which are decomposed by heat into metal and oxygen is .....

a. $Cu(OH)_2$ b. $CaSO_4$ c. $CuCO_3$ d. HgO

28.Carbon dioxide evolves during thermal decomposition of ..... compound.

a. HgO b. $CuSO_4$ c. $CuCO_3$ d. $Cu(OH)_2$

29.substitution reactions between salt solutions are accompanied by formation of .....

a. metal. b. a precipitate. c. an oxide. d. a non-metal.

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30.On adding silver nitrate solution to sodium chloride solution, ... is formed.

a. a white precipitate of sodium nitrate
b. a white precipitate of silver chloride
c. a blue precipitate of silver chloride
d. no precipitate

31.When hydrochloric acid reacts with sodium carbonate, then the reaction produces gas which .....

a. turbid limewater.
c. increases ignition.
b. burns with pop sound.
d. its color is red brown.

32.The reaction in which double substitution occurs between the ions of two compounds to form two other new compounds is called..... reaction.

a. double substitution
b. simple substitution
c. neutralization
d. oxidation and reduction

33.The rate of breaking up of hydrogen peroxide increases by the addition of .....

a. manganese oxide.
b. magnesium oxide.
c. manganese dioxide.

34.The speed of most chemical reactions is ..... by rising temperature.

a. increased b. decreased c. not affected

35.The reaction between silver nitrate and sodium chloride is from ..... reactions.

a. fast b. intermediate c. slow d. very slow

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✸(3) Complete the following :

1. During ..... reaction, the compound is decomposed by heat into its simple components, and in the ..... reaction a metal substitutes another one in its salt solution.
2. Na_2CO_3 +..... → $2NaCl + H_2O + CO_2$
3. The reactions of covalent compounds are slower because they take place between .....
4. Sweet potato contains ..... enzyme which helps in decomposition of hydrogen peroxide.
5. Reaction between an acid and an alkali forms ..... and .....
6. During the chemical reaction, the concentration of reactants gradually ..... , whereas the concentration of products gradually .....
7. The speed of chemical reaction can be measured by the rate of appearance of one of ..... substances.
8. At the beginning of the chemical reaction the percentage of the reactants concentration equal ..... %
9. The breaking up of bonds in the molecules of reactants and the formation of new bonds in the molecules of product is called .....
10. The compound decomposes by heat into its simple components in .... reactions.
11. In the reaction of sodium with chlorine to form sodium chloride, ... is considered as an oxidizing agent, and ..... is considered as a reducing agent.
12. Nitrogen pentoxide breaks up into ..... gas and ..... gas.
13. The reaction of covalent compounds are ..... than of the ionic compounds.
14. Chemical reaction is ..... in the reactant molecules, and ..... in the products molecules.
15. Most metals ..... decompose to ..... and sulpher trioxide.
16. When magnesium replaces copper in its salt solution a precipitate its color is ..... is formed.
17. Neutralization it is the reaction between an acid and an alkali forming ..... and .....
18. During the chemical reaction, the concentration of ..... decreases, while the concentration of ..... increases by the time.

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19. Carbon dioxide gas detected by changes ..... into turbid.

20. Sodium metal reacts with water producing sodium hydroxide and ..... gas evolves.

21. The speed of chemical reaction can be practically measured by the rate of..... of reactants or the rate of ..... of resultants.

✸(4) Correct the underlined words:

1	Most metal carbonates decompose by heat to metal oxide and **nitrogen** gas evolves.	.....
2	**Oxidation** is a chemical process in which an atom gains one electron or more.	.....
3	In **positive catalysts** reaction, catalyst is used to slow down the chemical reaction.	.....
4	Rate of reaction of the dilute hydrochloric acid with iron filling is **slower** than that with the same mass of a piece of iron	.....
5	**The iron rust** is a fast chemical reaction	.....
6	Nitrogen pentoxide breaks up into nitrogen dioxide gas and **nitrogen** gas	.....
7	The reactions of the covalent compounds are **fast**	.....
8	On adding piece of magnesium to copper sulphate solution **black** precipitates is formed.	.....
9	The ionic compounds are fast in their reactions, because they decompose into **molecules** that easily share in the reaction.	.....
10	When we add silver nitrate solution to sodium chloride solution, a **black** precipitate is formed	.....
11	Mercuric oxide is **silvery** color	.....
12	Rate (speed) of chemical reaction is increased by **decreasing** the temperature.	.....
13	The **catalyst** is the substance which loses one or more electrons during the chemical reaction.	.....
14	**Oxygen** gas detected by changes limewater into turbid.	.....

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✸(5) Give reason for:

1. Copper doesn't react with dilute hydrochloric acid whereas zinc reacts with it.

.....

2. The rate of chemical reaction increases by increasing concentration of reactants.

.....

3. A red precipitate is formed when magnesium is added to copper sulphate solution.

.....

4. The combustion of the steel scourers used for cleaning aluminium pots in a jar contains oxygen is faster than its combustion in the air.

.....

5. Adding a piece of sweet potato enhances the decomposition of the hydrogen peroxide.

.....

6. A white precipitate is formed on adding silver nitrate solution to sodium chloride solution.

.....

7. Diluted Hydrochloric acid does not react with the copper.

.....

8. Reactions between ionic compounds are fast whereas reactions between covalent compounds are slow.

.....

9. The rate of the chemical reaction increases by increasing temperature.

.....

10. The rate of the reaction of hydrochloric acid with the iron filings is faster than that with a piece of iron of the same mass.

.....

11. Although aluminum comes before zinc in chemical activity series, but it takes a longer time to react with hydrochloric acid practically.

.....

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✸(6) What happen if:

1. Heating red mercuric oxide HgO.

.....

2. Putting a piece of magnesium in copper sulphate solution.

.....

3. Add a small piece of sodium metal to water.

.....

4. Increase in the concentration of the reactants. (According to the speed of the chemical reaction).

.....

5. Adding manganese dioxide to a test tube containing hydrogen peroxide.

.....

6. Replacing a piece of iron with iron filings has the same mass on reacting with diluted acids.

.....

7. Heating green copper carbonate.

.....

8. Adding silver nitrate solution to sodium chloride solution.

.....

9. To the number of collisions when adding a negative catalyst to a chemical reaction.

.....

10. To the colour of red mercuric oxide when it is heated.

.....

11. Adding hydrochloric acid to sodium carbonate salt.

.....

12. Increasing surface area according to the reactants.

.....

13. Heating blue copper hydroxide.

.....

14. Adding a negative catalyst to rapid reaction.

.....

15. Heating of sodium nitrate.

.....

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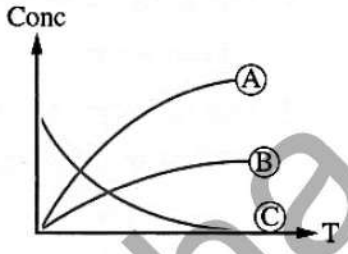
✸(7) Problems

1

$$2NaNO_3 \xrightarrow{\Delta} 2NaNO_2 + O_2$$

From the chemical equation and the opposite graph mention which curve represents the concentration of each :



1. Sodium nitrate.
2. Oxygen gas.
3. Sodium nitrite.

.....

.....

.....

2

From the opposite reaction :

① $\boxed{A} \xrightarrow{\Delta} H_2O + CuO$

② $2Na + 2H_2O \longrightarrow 2NaOH + \boxed{B} + heat$

③ $CuO + \boxed{B} \xrightarrow{\Delta} H_2O + \boxed{C}$

1. Write chemical formula for $\boxed{A}$ $\boxed{B}$ $\boxed{C}$
2. What is the type of reaction in ①, ②, ③
3. What is the name of chemical process which appears to black copper oxide in reaction ③ ?

.....

.....

.....

.....

3

From the following two equations answer the following :

① $2(A) + 2Na \longrightarrow 2NaOH + (B) + heat$

② $(B) + CuO \xrightarrow{\Delta} Cu + (A)$

1. Write the chemical formula for the (A) & (B) substances.
2. How to detect the substance (B) ?
3. What is the type of reaction No. ①, and what is the type of reaction No. ② ?

.....

.....

.....

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4

From the following table choose a statement from column (B) and another one from column (C) to be suitable for the items in column (A) and write a complete statement.

(A)	(B)	(C) Type of reaction
1. $NaNO_3$ 2. Al	a. decomposed by heat b. replace the hydrogen in water c. is formed in the form of white precipitate d. replace the hydrogen of the acid after a while.	e. Salt is formed and hydrogen gas evolves. f. When it reacts with silver chloride. g. Produce yellowish white substance and oxygen. h. Oxide is formed and oxygen evolves.

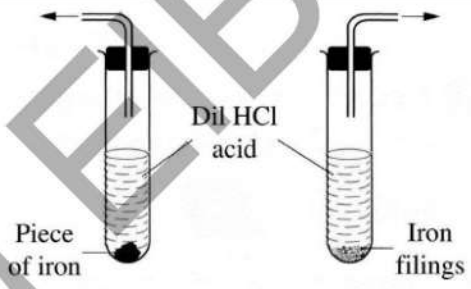
.....

.....

5

From the two opposite figures :

1. Express this reaction with a balanced symbolic chemical equation.
2. What is the factor that affects the speed of this reaction ?
3. What happens on replacing iron by copper ?



.....

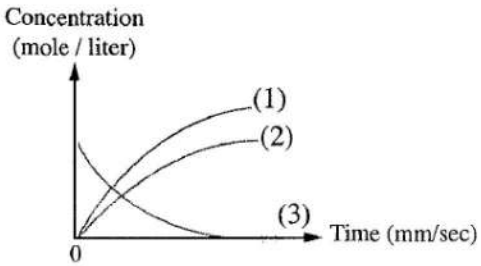
.....

.....

6

The opposite graph represents the rate of rapid decomposition of the substance of sodium azid. (which is present inside the air bag)

$2NaN_3 \xrightarrow[\text{spark}]{\text{Electric}} 2Na + \cdots\cdots$



1. Complete the equation.
2. From the graph, write the name of compound indicated by each number.
3. Mention the importance of air bag.

.....

.....

.....

.....

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Model Answer

✸ (1) Write the scientific term :

1. Oxidation process
2. Reduction process
3. Speed of chemical reaction
4. Oxidase enzyme
5. Catalytic converter
6. Catalyst
7. Enzyme
8. Chemical reaction
9. Neutralization reaction
10. Simple substitution reaction
11. Oxidation
12. Positive catalytic reaction
13. Double substitution reaction
14. Reducing agent
15. Salt and water
16. Speed of chemical reaction
17. Oxidation process
18. Chemical reaction
19. Catalyst

✸(2) Choose the right answer:

1. B
2. C
3. A
4. B
5. A
6. C
7. C
8. C
9. B
10. B
11. B
12. C
13. B
14. A
15. C
16. D
17. B
18. D
19. B
20. C
21. A
22. B
23. C
24. D
25. B
26. C
27. D
28. C
29. B
30. B
31. A
32. A
33. C
34. A
35. A

✸(3) Complete the following :

1. Thermal decomposition – simple substitution
2. 2HCl
3. Molecules
4. Oxidase
5. Salt – water
6. Decrease – increase
7. Product
8. 100
9. Chemical reaction
10. Thermal decomposition
11. Chlorine – sodium
12. NO_2 – O_2
13. Slower
14. Breaking – formation
15. Sulphate – metal oxide
16. Red
17. Salt – water
18. Reactant – product
19. Clear lime water
20. Hydrogen
21. Disappearance – appearance

✸(4) Correct the underlined words:

1. Carbon dioxide
2. Reduction
3. Negative catalyst
4. Faster
5. Fireworks
6. Oxygen
7. Slow
8. Red
9. Ions
10. White
11. Red
12. Increasing
13. Reducing agent
14. Carbon dioxide

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✸(5) Give reason for:

1.

Because zinc come before hydrogen in the chemical activity series, so they replace the hydrogen of acid, while copper comes after hydrogen in the chemical activity series, so it can't replace the hydrogen of acid.

$Zn + 2HCl \xrightarrow{dil.} ZnCl_2 + H_2\uparrow$

2.

Because by increasing the number of reactants molecules, the number of probable collisions between them increases, so the speed of reaction increases.

3.

Because magnesium comes before copper in the chemical activity series, so it replaces copper in copper sulphate solution and copper precipitates as a red ppt.

$Mg + CuSO_4 \longrightarrow MgSO_4 + Cu\downarrow$

4.

Due to increasing the speed of chemical reaction by increasing the concentration of oxygen gas.

5.

Because the oxidase enzyme in sweet potato acts as a catalyst which increases the rate of decomposition of hydrogen peroxide into water and oxygen gas.

6.

Due to formation of silver chloride salt which doesn't dissolve in water.

$NaCl + AgNO_3 \longrightarrow NaNO_3 + AgCl\downarrow$

7.

Because copper comes after hydrogen in the chemical activity series, so it can't replace the hydrogen of acid.

8.

Because the reactions of ionic compounds take place between ions, while the reactions of covalent compounds take place between molecules.

9.

Because by increasing the temperature, the number of probable collisions between reactants molecules increase, so the speed of reaction increases.

10.

Because the surface area in case of iron filings is larger than that in case of iron block and the speed of chemical reactions increases by increasing the surface area.

11.

Due to the presence of a layer of aluminum oxide (Al_2O_3) on aluminum surface, which takes time to separate from aluminum, which delays the starting of occurrence of the reaction.

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✸(6) What happen if:

1.

A silvery precipitate of mercury is formed and oxygen gas evolves.

$$2HgO \xrightarrow{\Delta} 2Hg + O_2\uparrow$$

2.

The blue colour of copper sulphate disappears and a red precipitate of copper is formed.

$$Mg + CuSO_4 \longrightarrow MgSO_4 + Cu\downarrow$$

3.

A reaction take place and hydrogen gas evolves

$$2Na + 2H_2O \longrightarrow 2NaOH + H_2\uparrow + heat$$

4.

The speed of the chemical reaction increases, due to the increase in the number of probable collisions between reactant molecules.

5.

Hydrogen peroxide decomposes (breaks up) rapidly into water and oxygen gas evolves.

6.

The speed of the chemical reaction decreases.

7.

A black substance of copper oxide is formed and carbon dioxide gas evolves.

$$CuCO_3 \xrightarrow{\Delta} CuO + CO_2\uparrow$$

8.

A white precipitate of silver chloride is formed.

$$NaCl + AgNO_3 \longrightarrow NaNO_3 + AgCl\downarrow$$

9.

The number of collisions decreases .

10.

The silvery colour of liquid mercury will be formed.

11.

An effervescence occurs due to evolving of bubbles of carbon dioxide gas.

$$Na_2CO_3 + 2HCl \xrightarrow{dil.} 2NaCl + H_2O + CO_2\uparrow$$

12.

The speed of chemical reaction increases.

13.

A black substance of copper oxide is formed and water vapour evolves.

$$Cu(OH)_2 \xrightarrow{\Delta} CuO + H_2O\uparrow$$

14.

The speed of the reaction will be decreased.

15.

A yellowish white substance of sodium nitrite is formed and oxygen gas evolves.

$$2NaNO_3 \xrightarrow{\Delta} 2NaNO_2 + O_2\uparrow$$

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✸(7) Problems

1	1. Curve **(C)** 2. Curve **(B)** 3. Curve **(A)**
2	1. (A) chemical formula is $Cu(OH)_2$ (B) chemical formula is H_2 (C) chemical formula is Cu 2. Reaction (1) is thermal decomposition reaction. Reaction (2) is simple substitution reaction. Reaction (3) in oxidation and reduction reaction. 3. Reduction process.
3	1. (A) is H_2O (B) is $H_2\uparrow$ 2. In general , we detect H_2 gas by approching a burning match to it, so it burns with a pop sound. 3. Reaction No. (1) is simple substitution reaction. Reaction No. (2) is oxidation and reduction reaction.
4	1. $NaNO_3$ decomposed by heat, produce yellowish white substance and oxygen. 2. Al replace the hydrogen of the acid after a while, salt is formed and hydrogen gas evolves.
5	1. $Fe + 2HCl \longrightarrow FeCl_2 + H_2\uparrow$ 2. The surface area of the reactant. 3. No reaction ocurs.
6	1. $3\ N_2$ 2. **(1)** Nitrogen gas ($3N_2$) **(2)** Sodium ($2N_2$) **(3)** Sodium azid ($2\ Na\ N_3$) 3. It is one of the most important safety means of car, where it inflated by nitrogen gas at an extreme speed on the occurrence of car accident.

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Unit one

Lesson one: Chemical reactions

Question one: complete the following statements:

1) …….. gas turbid the lime water, while …….. gas helps in burning.
2) By heating copper hydroxide, its color changes from …….. into …….
3) Sodium nitrate decomposes by heat into ……. and ……., while …… salt decomposes into copper oxide and sulpher trioxide gas.
4) When sodium reacts with water , …….. gas evolves , while ……. gas evolves by heating of blue copper sulphate.
5) The changing of the (Mg) into (Mg^+) is considered …… process , while the changing of (O^-) into (O) is considered …….. process.
6) When the hydrogen gas passes on a hot copper oxide , copper oxide changes to be ……. and …… is formed.
7) The reaction of salt solutions together is considered as …… reactions , which accompanied with the formation of ……..
8) In the following reaction " $H_2 + CuO \longrightarrow H_2O + Cu$, hydrogen gas is considered as …… agent while copper oxide is considered as ……. agent.
9) The metals is arranged descendingly according to ……. in the chemical activity series.
10) $2Na + 2H_2O \rightarrow$ ……. + H_2 + …….
11) $2Al + 6HCl \rightarrow$ …….. + ……..
12) Na_2CO_3 + ……. → 2NaCl + …….. + ……...

Question two: What is meant by each of the following?

1) Chemical reaction.
……
2) Simple substitution reactions.
……

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3) Double substitution reactions.

……

4) Oxidation (two definitions)

……

……

5) Reduction (two definitions)

……

……

6) Oxidizing agent (two definitions)

……...

……...

7) Reducing agent (two definitions).

……...

……...

8) Neutralization.

……..

Question three: Choose the correct answer:

1) …… metal doesn't replace the hydrogen of the diluted acids.

(Magnesium – silver – zinc – iron)

2) Which of the following substances doesn't produce black product?

(HgO – $Cu(OH)_2$ – $CuSO_4$ – $CuCO_3$)

3) Active metals replace the hydrogen of the water and …… produce.

(Metal oxide – metal hydroxide – metal carbonate – metal sulphate)

4) In the oxidation reduction reactions , the number of the loosed electrons are …….. the gained electrons. (More than – less than – equal to)

5) When potassium reacts with diluted hydrochloric acid , hydrogen gas evolves and …….. salt is formed.

(potassium nitrate – potassium sulphate – potassium chloride – potassium hydroxide)

6) Oxidation and reduction are ……. processes.

(concurrent – separated – no correct answer)

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Question four: Give reason "using chemical equations if it is possible":

1- Zinc reacts with the diluted hydrochloric acid while copper doesn't with the same acid.

……

……

2- A white precipitate is formed when silver nitrate solution is added to sodium chloride solution.

……

……

3- A black substance is formed by the heating of green copper carbonate.

……

……

4- An effervescence occurs when sodium carbonate is added to hydrochloric acid.

……

……

5- A red ppt. is formed by adding magnesium to the copper sulphate solution.

……

……

6- Oxidation doesn’t mean the combination with oxygen only.

……

……

7- Metals are considered as reducing agents.

……

……

8-Non- metals are considered as oxidizing agents.

……

……

9- Double substitution reactions don't contain oxidation and reduction.

……

……

10- Mass of sodium nitrate decreases by heating.

……

……

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Question five: Show by the chemical balanced equations the following:

1- The effect of heat on the red mercuric oxide.

……

2- Adding of hydrochloric acid to the sodium carbonate.

……

3- Reduction of the hot copper oxide by passing of the hydrogen on it.

……

4- Adding of silver nitrate solution to the sodium chloride solution.

……

5- Passing of hydrogen gas on the hot black copper oxide.

……

6- The reaction of salt and acid.

……

Question six: Put (✓) or (×) with correction:

1- The substance that produces from the chemical reaction is the same substance that enter in it ( )

2- Red mercuric oxide decomposes by heat into silver color precipitate in the tube ( )

3-Non metals are arranged descendingly according to their chemical activity series. ( )

4-Neutralization is the reaction of acid and base to form salt only. ( )

5-Hydrogen gas evolves when sodium reacts with water. ( )

6-Copper is more active than magnesium. ( )

7-Decreasing the percentage of hydrogen in the matter is the result of oxidation process. ( )

8-The reaction between chlorine and sodium includes oxidation and reduction processes. ( )

9- Oxidation and reduction are concurrent processes. ( )

Question seven: The opposite equation represents an oxidation and reduction reactions…complete writing the reason:

- Process (x) represents …… reaction.
- Process (y) represents …… reaction.
- What are the oxidizing and reducing agents?

$$2H_2S + SO_2 \xrightarrow{x,\ y} 3S + 2H_2O$$

……

……

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Question eight: Mention the oxidizing and reducing agents in the following reactions:

$2Mg + CO_2 \longrightarrow 2MgO + C$

$2Al + 3FeSO_4 \longrightarrow Al_2(SO_4)_3 + 3Fe\downarrow$

.....

.....

.....

Question nine: Complete the following chemical reactions:

1- $2HgO \xrightarrow{\triangle} 2$ ---------- + O_2

2- ---------- $\xrightarrow{\triangle}$ Cu O + H_2O

3- $CuCO_3 \xrightarrow{\triangle}$ ---------- + ----------

4- $2NaNO_3 \xrightarrow{\triangle} 2$ ---------- + O_2

5- -------- + 2 $H_2O \longrightarrow$ 2 NaOH + ---------- + heat

6- Zn + -------- $\longrightarrow$ Zn Cl_2 + ----------

7- 2Al + --------- $\longrightarrow$ $2AlCl_3$ + ----------

8 - ------+ $CuSO_4 \longrightarrow$ Mg SO_4 + ----------

9- ---------- + HCl $\longrightarrow$ NaCl + ----------

10- ----------+ 2HCl $\longrightarrow$ 2NaCl + ---------- + ----------

11- NaCl + ---------- $\longrightarrow$ ---------- + AgCl

12- 2Na + ----- $\longrightarrow$ ----------

13- 2Na $\longrightarrow$ ---------- + $2e^-$

14- Cl_2 + -------- $\longrightarrow$ $2Cl^-$

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Question

How can you get sodium nitrite from copper hydroxide??

.....

.....

.....

Question

How can you get copper from "copper sulphate" with two different ways?

.....

.....

.....

Complete the following

$$CuSO_4 \xrightarrow[(1)]{\triangle} A + B$$

$$B \xrightarrow[(3)\ +\ \triangle]{} \text{Red ppt. } D + H_2O$$

$$2Na + 2H_2O \xrightarrow[(2)]{} C$$

Write what are these letters (A, B , C , D) indicate ?

.....

.....

What is the type of the reaction number (1) ?

.....

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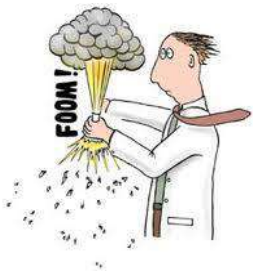
Lesson two: Speed of chemical reactions



Question one: Complete the following diagram:

Speed of chemical reaction mean:

.....

.....

and it affects by:

....

....

....

....

....

....

or

....

Slow Fast

Where the collisions between molecules increases

Question two: Give reasons for :

1) Chemical reactions are different in their speeds.

.....

.....

2) Reaction of sodium chloride with silver nitrate is fast.

.....

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3) The reaction hydrochloric acid with iron filings is faster than the reaction with the iron piece.

……...

……

4) You should chew the food well before swallowing.

……

……

5) The increase in the concentration of reactants leads to the increase in the speed of the chemical reaction.

……

……

6) The non frozen food spoilt quickly.

……

……

Question three: In the following figure , answer :

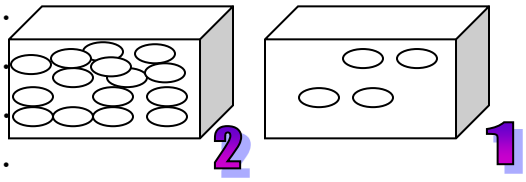
- The two boxes are equal in their volumes.
- Box (1) contains less amount of oxygen than box (2).
- In which box does the aluminum burn quickly? Why?

……

……

……

……



- Mention other factors affecting the speed of the chemical reactions.

……

……

Question four: Write shortly about the catalysts.

……

……

……

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Question five: Write the relation between each of the following as in the example:

The relation between	The relation
The exposed area to the reaction and the speed of the chemical reaction	Direct
The concentration of the reactants and the speed of the chemical reaction	
Temperature and the speed of the chemical reactions	
The reaction of the ionic compounds and the speed of the chemical reaction	

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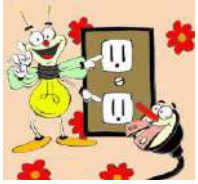
Unit two

Lesson one: Physical properties of the electric current



Question one: Complete the following statements:

1) Electric current can be used in the …… , …….. and ……..
2) When the force of the nucleus becomes weak or stopped so …… becomes free and flow in the electric conductor.
3) The electric current is ……
4) The physical properties of the electric current are …… , ……. and ……
5) Current intensity is ……
6) The electric current can be detected in the circuit by using ……
7) Current intensity = …… ÷ ……..
8) Ammeter is connected in …… in the circuit.
9) The current intensity that flows in the circuit when the amount of charges is 1 coulomb and the time needed is 1 second is called ……
10) The electric potential is ……
11) The potential difference is ……
12) The transfer of electric charges from electric conductor to another depends on the ……
13) The electric potential difference is measured by the …… apparatus and …… unit.
14) The work done to transfer electric charges is measured by …….. unit.
15) Coulomb is ……
16) Voltmeter is used to measure …… and ……..
17) Voltmeter is connected in …… in the circuit.
18) The potential difference between the two poles of the battery when the circuit is opened is called ……
19) Volt is ……

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20) Ammeter is symbolized with …….. in the circuit , while voltmeter is symbolized with ……

21) The opposition that the current faces during its motion in the wires is called ……

22) The measuring unit of the electric resistance is ……..

23) Ohm is ……..

24) The two types of the electric resistance are …… and …….

25) The constant resistance is symbolized by …… in the circuit.

26) The rheostat is consists of …….. , ……. , …….. and ……

27) The idea of operation of the electric rheostat depends on …….

28) The relation between the current intensity and potential difference is ……. , while the relation between current intensity and resistance is …….

29) The value of the current intensity can be changed (controlled) by using …… apparatus.

30) The function of the electric resistance is ……

31) Ohm's law states that …… and its mathematical relation is ……

32) The ratio between the potential difference and the current intensity is called …….

33) The electric resistance value is changed in the circuit when the …… is changed.

Question two: Give reasons for:

1) The value of the current intensity increases if the time needed to transfer the charges decreases.

……

2) Some electrons become free when a conductor is connected with another.

……

3) Ammeter is connected in series in the electric circuit.

……

4) The value of the current intensity increases as the resistance decreases.

……

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5) There are different types of the electric resistance.

……

6) The importance of Ohm's circuit.

……

Question three: show by drawing each of the following:

1) Ammeter in the electric circuit.

2) Voltmeter in the electric circuit.

3) An electric circuit which gets the relation between the current intensity and the potential difference (Ohm's circuit).

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Question four: Write the mathematical relations for:

1- Measuring the potential difference. ……

2- Measuring the current intensity. ……

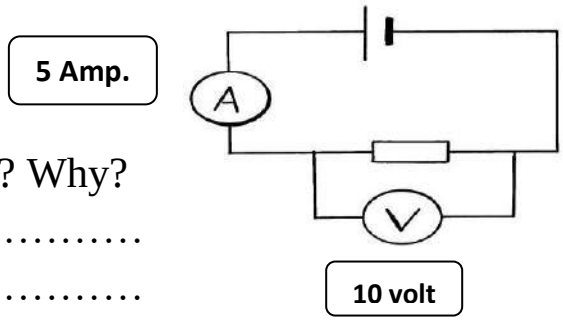
3- Measuring the amount of electricity (two relations) :

……

……

4- Electric resistance. ……

Question five: variant problems:



1- Look to the opposite figure then answer:

- Dose the circuit verify Ohm's law practically? Why?

……

……

- Calculate the value of the resistance .what is its type ?

……

2- Calculate the amount of electricity that flow in a conductor if its resistance is 2200 Ohm for 2 minutes when it is connected to potential source = 220 V.

……..

3- Calculate the amount of the work done to transfer an amount of electricity of 400 coulomb between two terminals of potential difference of 4.5 V.

……...

4- Calculate the amount of electric current that resulted due to the flow of electricity of 5400 coulomb in 5 minutes.

……...

5- Calculate the amount of work done to transfer an amount of electricity of 20 coulomb between two terminals of potential difference of 10 V.

……...

6- If an electric current of 20 Ampere has flown in the electric heater and the p.d was 220 , determine the electric resistance of the heater.

……...

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7- An electric appliance works with a potential difference 220 volts and electric resistance 20 Ohm. Calculate the current intensity and the amount of electric charges through 5 seconds.

8- Calculate the amount of charges that flow through a wire if the electric intensity equals 6 amperes through 3 seconds.

9- If an electric heater connected to a source of electric current its intensity =2 ampere. Calculate the amount of charges that flow through a wire in 4.2 sec.

10- Calculate the work done by a battery its e.m.f = 12 volts to transfer an electric charge of 2.5 coulomb in an electric circuit.

11- Calculate the work done to transfer electric charge is 50 coulomb if the p.d between two terminals of the wire = 12 volts.

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13- Calculate the time of transferring of electric charges = 60 coulombs in an electric circuit if the current intensity = 0.25 amperes.

14- Calculate the time of transferring of electric charges = 10 coulombs in an electric circuit if the current intensity = 5 amperes.

15- Calculate the current intensity that flow through a wire if the electric charge equals 20 coulombs in a time 4 seconds.

16- Calculate the current intensity that flow through a wire if the electric charge equals 180 coulombs through 2 minutes.

17- If the p.d between the two poles of a phone = 24 volts, what is the electric resistance of the phone wires if the current intensity is 0.03 ampere.

18- Calculate the p.d between two terminals of the wire when the work done to transfer electric charge is 8 coulomb = 32 joules.

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Question six: write the scientific term for each of the following:

1- The flow of electric charges in an electric wire. (……)
2- The amount of electricity in coulomb that flow in an electric wire in a unit time. (……)
3- The measuring units of the electric charges. (……)
4- The apparatus that uses to determine the E.M.F (……)
5- The electric current that is resulted from the passing of electric charges of 1 coulomb in unit time. (……)
6- The apparatus that is connected in series to measure the current intensity. (……)
7- The state of the conductor that show the transfer of electricity from and to it. (……)
8- The charge that is transfer with an intensity of 1 Ampere in one second. (……)
9- The potential difference between two terminals of a conductor when a work done to transfer charge of 1 coulomb is 1 joule. (……)
10- The opposition that the current faces during its motion in the electric conductor. (……)
11- The measuring unit of the electric resistance. (……)
12- The resistance which is symbolized —⧚—). (……)
13- An electric circuit that is used to get the relation between the electric current and potential difference . (……)
14- The ratio between the electric current and the potential difference. (……)
15- The resistance of a conductor in which the electric current is 1 Ampere and the potential difference is 1 volt. (……)

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Question seven: Define each of the following :

1) Electric current.

……...

2) Current intensity.

……...

3) Ampere. (two definitions).

……...

……...

4) Coulomb.(two definitions)

……...

……...

5) Electric potential.

……...

6) Potential difference.

……...

7) The volt. (Two definitions).

……...

……...

8) Joule.

……...

9) E.M.F

……...

10) Electric resistance.

……...

11) Ohm.

……..

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Question eight: What is meant by?

1) The current intensity passes in the conductor 1.5 ampere.

……...

2) The potential difference between two terminals of a conductor is 5 volts.

……...

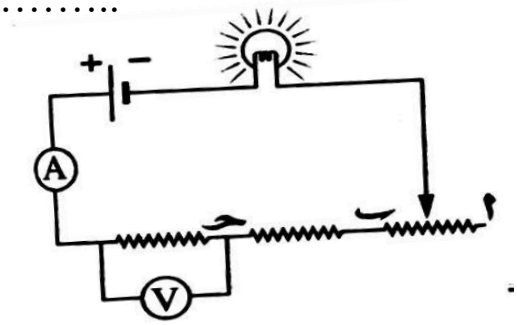
3) A resistance of a conductor = 5 Ohms.

……...

Question nine:

1- From the opposite figure, illustrate at which point you get ?

- The strongest lightning of the bulb. ……
- The smallest reading of the ammeter. ……..
- The largest reading of the circuit. ……..



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Lesson two: Electric current and cells

Question one: put (✓) or (×) and correct the wrong one:

1) Chemical energy can be changed into electric energy through the electric generators. ( )

2) The electric current that resulted from the electrochemical cells is known as alternating current. ( )

3) In dynamo, the mechanical energy is converted into electric energy. ( )

4) From the advantages of the A.C is its ability to be converted into D.C

5) A.C is resulted from waterfalls. ( )

6) Electrons flow in the D.C in two different directions. ( )

7) D.C is used in the lightning of the streets and electroplating. ( )

8) The electric cells are connected in the circuit is series only. ( )

9) The E.M.F of a battery increases when the cells are connected in parallel.

( )

10) The negative pole is connected with another negative in the battery. ( )

11) The E.M.F of a battery which their cells are connected in series is calculated from the relation (e.m.f of one cell × N). ( )

Question two: Compare in table between each of the following " use diagrams if it is needed" :

1- Alternating and direct currents.

……

……

……

……

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2- Connecting the cells in series and in parallel.

……

……

……

……

3- The resulted (E.M.F) from the connection in series and in parallel.

……

……

……

……

Question three: Give reason for each of the following:

1- Alternating current is preferable in using than direct current.

……

……

2- The reading of the voltmeter is changed if 4 cells are connected in series than in parallel.

……

……

Question three: Show by drawing only:

1) The connection of 3 cells each of 1.5 volts to get an e.m.f with :

a. 1.5 volt b. 3 volt c. 4.5 volt

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2) The connection of 4 similar cells , each of 1.5 volt to get an e.m.f :

a. 6 volt

b. 4.5 volt

c. 3 volt (two methods)

d. 1.5 volt

3) The connection of 5 similar cells of e.m.f for each is 3 volt to get :

a. 9 volt

b. 15 volt

c. 3 volt

-If the e.m.f for 5 similar electric cells connected in parallel = 3 volts , what is the e.m.f for one cell?

---

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Lesson three: Radioactivity and nuclear energy

Question one: Choose the correct answer:

1- Mass of the nucleus is concentrated in the ……

(energy levels – nucleus – electrons)

2- The source which the atom gets its tremendous energy is known as …….

(Nuclear energy – electric energy – heat energy)

3- There is …… force between the components of the nucleus.

(repulsion – attraction – both are correct)

4- The French scientist …….. is considered the discover of the radioactive phenomenon.

(Mendel – Ohm – Bequruel)

5- The radiation that comes out from the Uranium element is ……. and has the ability to penetrate solids.

(visible – unseen – No correct answer)

6- …….. come (s) out from the radioactive element.

(rays only – particles only – both are correct)

7- The natural radioactivity is done by ……

(Controlling the nuclear energy – No ability to control the nuclear energy – both are correct)

8- There are several theories for …… in the fields of atomic bomb.

(Dr.Ali Mostafa Mosharafa – Ohm – Mendel)

9- The natural sources of the radioactive pollution is represented by ……

(Cosmic radiation – nuclear reactors – no correct answer)

10- Chernobyl accident produces the isotopes of …….. radioactive element.

(Uranium – cesium – polonium)

11- Bone marrow can be destroyed as a result of exposure to …… amount of radiation for ……. periods.

(large and short – long and small – both are correct)

12- Physical effects take place as a result of the exposure to …… amount of radiation.

(Large – small – both are correct)

13- The exposure to the small amount of radiation resulted in a cellular effects as ……

(Spleen damaging – changing in the sex chromosomes – changing in the hemoglobin structure)

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15- The area chosen for the storing of the radioactive wastes should be ……

(Unstable – away from the volcanoes – both are correct)

16- The medium radioactive wastes are disposed in the earth after …….

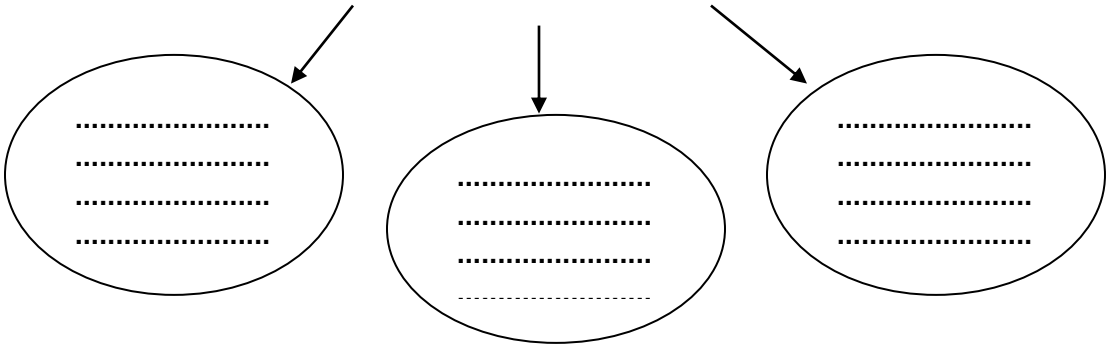
(Surrounding them with a layer of the cement only – surrounding them with rocks only – both are correct)

17- …… is from the radioactive elements.

(Iodine – zirconium – sodium)

Question two: complete the following:

1 The nuclear energy arises from



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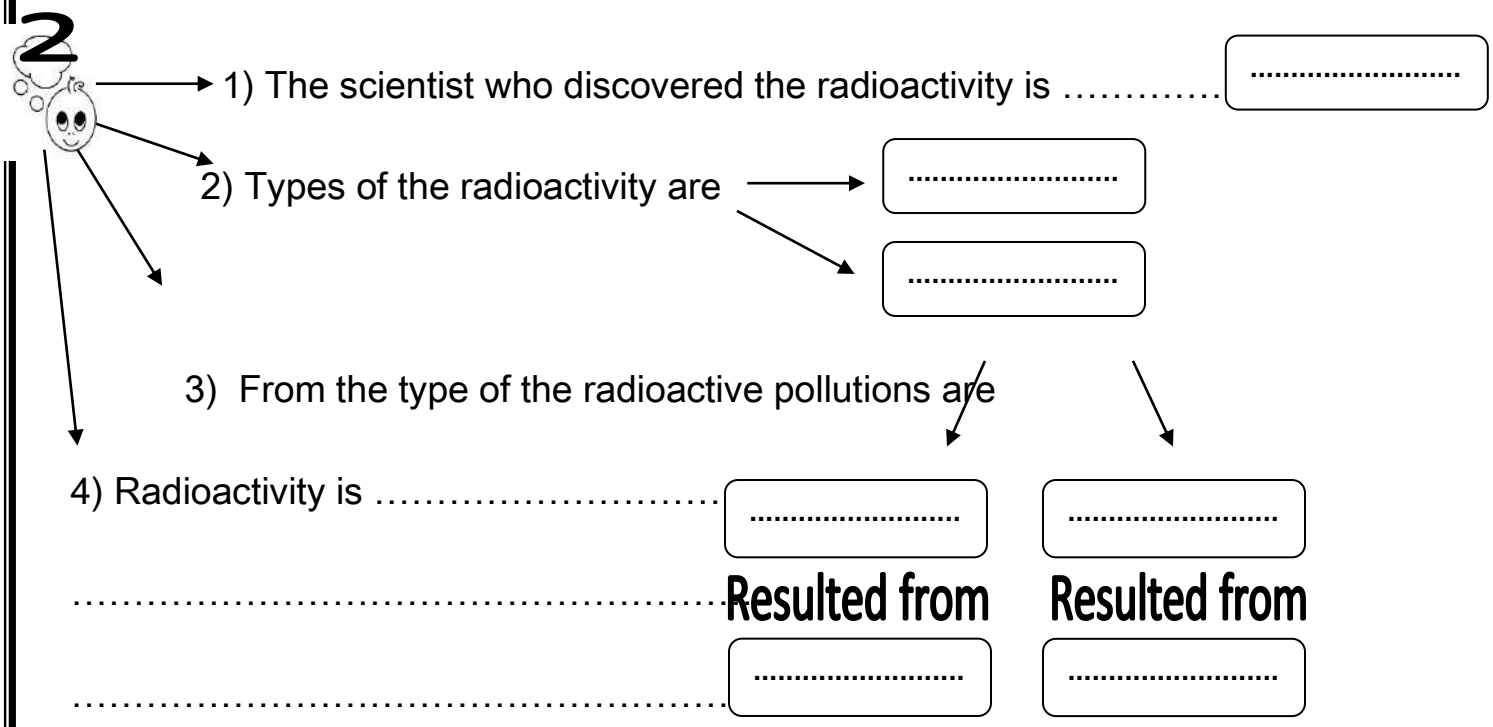

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3

The radiation affects the human body due to the exposure to:

..... amount of radiation

..... amount of radiation
And that causes:
.....
.....

.....
.....

.....
.....

.....
.....

And that causes

Question three: Give reasons for:

1) The nucleus is considered as the energy store.

.....

.....

2) Radium element is considered a radioactive element.

.....

.....

3) There are two types of radiation.

.....

.....

4) Einstein described Dr. Ali Mostafa Mosharafa as the greatest atomic scientist in the world.

.....

.....

5) There are two sources of the radioactive pollutions.

.....

.....

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6) The reaching of the Chernobyl radioactive wastes to the food.

……

……

7) The harmful effects of the radiation on the human body.

……

……

8) Radioactive wastes should be disposed away from the underground water.

……

……

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Unit three

Lesson one: Principles of heredity

Question one: justify:

1) There are two types of the traits.

……

……

2) Mendel has chosen pea plant to conduct his experiments.

……

……

3) Stamen has removed from the pea flowers during the experiment.

……

4) Mendel has covered the pistils of the pea flowers during the experiment.

…….....

5) Individuals may be hybrid or pure.

……

……

6) The two genetic factors are separated during the formation of the first generation's gametes.

……

7) When a pea plant with red flowers has pollinated with another one with white flowers, all the produced generation will be with a red flowers.

……

8) The absence of freckles considered as a dominant traits in the human.

……

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Question two: complete the following:

1) There are two types of the traits in the livings ……. and …….
2) The scientist ……. has conducted the main principles of heredity.

3) The pea plant is …….. , so it could be self pollinated .

4) The life cycle of the pea plant is ……

5) Pea plant can be pollinated …….. or ……

6) In the pea plant there are contrasting traits as …….. and ……flower's color , …….. and …… pod's color , …….. and …….. seed's color.

7) The …… trait appears in the first generation only, while the …….. appears in the second with a percentage 25 %.

8) The …..… color of the pea plant's flower dominates the …… flower color.

9) The genetic factors is …… that transmitted from one generation to another through …….

10) Gametes are formed in the 1st generation by ……. division.

11) Genetic traits are transmitted through ……..

12) The genetic factors of one trait are segregated during the formation of ……

13) The symbols of the dominant trait is ……. , while the recessive one is ……

14) The symbol (yy) represents the ……. trait.

15) The symbol (YY) represents the ……. trait.

16) The law of segregation states that
……

……

17) The dominant traits are inherited to the recessive one in the ratio
……. : ……

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18) The second law of Mendel states that
……
……

19) From the dominant traits in the human body are …..…..… and …… ,while from the recessive traits are ……. and …….

20) The …….. science explains the transmission of heredity traits from …….. to offspring.

21) Mendel has chosen …… principle traits of the pea plant to conduct his experiment.

22) Mendel's first law is called ……. , while the second is called …….

Question three: answer the following:

1- Use the following symbols to conduct the results of the mating between the pea plant with flowers red color (RR) and another one with white flower colors (rr).
……
……
……

2- Show the resulted generation of the mating of two individuals hybrid (Rr) in which both are from the tall stemmed pea plant.
……
……
……

3- A mating between hybrid pea plants with red flowers (Rr) and another one with white flowers (rr) has occurred. Illustrate using heredity principles the traits of the resulted generation.
……
……
……

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Unit four

Lesson one: Hormones in the human body

Question one: Define each of the following:

1) Hormones.

……

2) Endocrine glands.

……

3) Dwarfism.

……

Question two: compare in a table between each of the following:

1) Simple goiter and exophthalmoses.

……

……

……

……

2) Dwarfism and gigantism.

……

……

3) Insulin and glucagon.

……

……

……

4) Duct and endocrine glands.

……

……

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Question three: Give reason for:

1) Endocrine glands are called ductless.

……

……

2) Pituitary gland is called "the master gland".

……

……

3) Pituitary gland controls the height which the body will reach.

……

……

4) The importance of the thyroid gland.

……

……

5) Pancreas is a double function gland.

……

……

6) Hormones work as the thermostat in the electric appliances.

……

……

7) Human is infected with diabetes disease.

……

……

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Question four: Choose the correct answer:

1) Hormones are secreted from special organs called …….
(Duct glands – ductless gland – both are correct)
2) The gland that locates under the brain is called ……
(Thyroid – adrenal – pituitary)
3) …… is considered the only way for the hormone to reach its site of work.
(Skin – blood – nerve)
4) The hormone that activates the mammary glands to secrete milk after delivery of the baby is secreted from the ……. gland.
(Pituitary – thyroid – reproductive)
5) Calcitonin hormone is secreted from …… gland.
(Thyroid – pancreas – testes)
6) …… is a double function gland.
(Thyroid – pancreas – tests)
7) The ……. hormone is secreted from the ovaries.
(Estrogen – testosterone – insulin)
8) Adrenaline is a hormone that is secreted in the case of ……
(Increase of the sugar percentage – emergencies – growth)
9) Glucagon affects on the …….. in which the rate of the changing of the glucose sugar increases.
(Spleen – liver – blood)

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Worksheet (1) – unit (1)

Complete:

1-The red mercury oxide decomposes by heat into……and ……gas evolves

2-Medicine,…….and…….are examples of the outcomes of some chemical reactions

3-Thermal decomposition reactions involve the…….of the compounds by the effect of…….

4-On heating copper hydroxide, its colour changes from…… to …….

5-Most metal carbonates undergo thermal decomposition into …… and……

6-White sodium nitrate decomposes by heat into…….which has……colour and oxygen gas evolves

7-Chemical activity series is the arrangement of metals in…….. order according to the degree of their……..

8-All element ……hydrogen in chemical activity series replace hydrogen in acid solution, while elements…….hydrogen don't replace hydrogen in acids except under certain conditions

9-Aluminum replaces the acid hydrogen easier than zinc as it comes ……zinc in the …….

10-The reaction between acid and alkali to produce……..and water is known as……..reaction

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11-Reduction is a chemical reaction which causes the decrease of ……percentage or the increase of……..percentage

12-oxidation and reduction are two……process

13-…….is a chemical process where an atom gains an electron or more

14- $Mg + CuSO_4 \longrightarrow$ ……..+……..

15-……..+…… $\longrightarrow$ 2NaCl

16- $CuSO_4 \longrightarrow$ ……. + ……..

Give reasons:

1-The formation of black substance by heating blue copper hydroxide

……

……

2-The occurrence of effervescence on putting a piece of aluminum in diluted hydrochloric acid

……

……

3-In the reaction of hydrogen with hot copper oxide, hydrogen is oxidized while copper oxide is reduced

……

……

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4-The formation of silvery colour on heating red mercuric oxide

……

……

5-Oxidation and reduction are concurrent processes

……

……

6-Sodium is kept under kerosene and never kept under the surface of water

……

……

Put (√) or (X) and correct the wrong ones:

1-Chemical reaction is the breaking up of bonds in the resultants and formation of new bonds in the reactants ( )

2-Oxidation and reduction are two separated processes ( )

3-Double substitution reaction occurs between the atoms of two compounds ( )

4-Both magnesium and zinc can replace copper in copper sulphate solution ( )

5-Oxidizing agent is the substance which loses an electron or more during a chemical reaction ( )

6-The gas which evolves from the reaction of sodium carbonate with dilute HCl turbids the limewater ( )

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7-Most metal carbonates decompose on being heated into metal oxide and carbon dioxide ( )

8-A reddish brown precipitate of magnesium sulfate is formed on adding magnesium to copper sulfate solution ( )

What is meant by ?

1-Chemical activity series

……

2-Double substitution reactions

……

3-Neutralization reactions

……

4-Reducing agent

……

5-Oxidation process

……

6-Thermal decomposition reactions

……

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Worksheet (2) – unit (1)

Complete:

1-Nitrogen pentaoxide breaks up into……and…….gas

2-The nature of the reactants is related to the kind of ……in reactants and the……. Of the reactants exposed to the reaction

3-At the end of the reaction, the concentration of reactants is……...%, while the concentration of products is……%

4-The speed of the reaction between dilute hydrochloric acid and a cube of acid because the……of iron fillings is larger

5-The speed of burning of aluminum coil in pure oxygen is……. Than its burning in atmospheric air.

6-the increase in concentration of reactants makes the chemical reaction …….

7-The catalyst decrease the……needed for the reaction

8-……....enzyme in sweet potato acts as a……..to increase the rate of H_2O_2 decomposition

9-The catalyst changes the ……of the reaction but doesn't affect either its……or end

10-Food is preserved in the freezer in order to……the reactions done by…….

11-……increase the number of collisions between molecules and consequently increase the speed of reactions

12-The measuring unit of the concentration of a substance is……

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13-Mg + 2HCl ⟶ …… + ……

14-Negative catalyst is the catalyst which……the chemical reaction

15-The speed of chemical reaction increases by increasing……..,

……and……

Give reasons:

1-A blue precipitate is formed on adding sodium hydroxide solution to copper sulphate solution

……

……

2-The speed of chemical reaction increases when the amount of the reactants increase.

……

……

3-Sweet potato enhance the decomposition of hydrogen peroxide

……

……

4-Food must be heated during its preparation

……

……

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5-Food goes rotten in summer days if it is not frozen

……

……

6-Magnesium reacts with concentrated hydrochloric acid faster than the diluted hydrochloric acid

……

……

Put (√) or (X) and correct the wrong ones:

1-The reaction of ionic compounds are slower than coordinate compounds ( )

2-The increase in the concentration of the reactants increase the number of collisions between molecules so that, the speed of reaction decreases ( )

3-A molecule of one enzyme can do its function million times per minute ( )

4-Increasing the speed of chemical reactions, by heat helps in cooking food ( )

5-The smaller the area exposed to the reaction is the slower the reaction is ( )

6-At the beginning of the reaction, the concentration of the reactants is zero 0% ( )

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What will happen if ?

1-Leaving food in summer days outside the fridge

……

……

2-The concentration of reactants becomes zero

……

……

3-Decreasing the energy needed for the reaction

……

……

4-Adding sodium hydroxide solution to a blue copper sulphate solution (write the equation)

……

……

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Worksheet (3) – unit (1)

Complete:

1-The…….is the substance which found with greater amounts in the solution and in which the…….is being dissolved

2-Solutions can be classified in terms of size of solute molecules into …….., …….and……

3-In colloidal solution, the solute particles can't be distinguished by the …….but can be distinguished by the……..

4-Homogenous solution consists of ……layer, while…… solution consists of two layers or more

5-In salty solutions, the table salt is the……and water is the …….

6-It is impossible to dissolve more solute in the ……..solution

7-……..and……are considered from homogenous solutions

8-Solutions can be classified in terms of homogeneity into……. And……solutions

9-Silver nitrates are used in the manufacture of……while potassium nitrates are used in the manufacture of……..and …….

10-The components of……and…….solutions can't be separated by refining or filtration

11-Sodium chloride is used in……and…….food

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12-Most bases have……..feel like……..

13-Sulphoric acid is used in……., ……..manufactures and ……

14-Green leaves of vegetables contain……acid which is necessary for the proper ……of cells

Give reasons:

1-Water and oil mixture is considered a non-homogenous solution

……

……

2-Milk is considered a colloidal solution

……

……

3-Acids are necessary for digestion process in human body

……

……

4-Eating of orange in winter is very important

……

……

5-Sodium and potassium minerals have a role in the human body

……

……

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6-Magnesium hydroxide is used in the manufacture of anti-acids medicines

……

……

What is meant by ?

1-The solution

……

2-Colloidal solution

……

3-Saturated solution

……

4-Homogenuous solution

……

5-Minerals

……

Compare between each pair of the following:

1-Colloidal solution & suspension solution

……

……

……

……

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2-Saturated solution & unsaturated solution

.....

.....

.....

.....

.....

3-Acids & bases

.....

.....

.....

.....

.....

4-Homogenous solution & non-homogenous solution

.....

.....

.....

.....

.....

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Worksheet (1) – unit (2)

Complete:

1-The nucleus of an atom contains …….which are positively charged and……

2-There are several physical properties of the electric current as the …….., potential difference and…….

3-the potential difference across a conductor is the…….done in joules to transfer a unit charge of……..coulomb between the two ends of this conductor

4-…….is measured by voltameter and has a measuring unit known as……..

5-The current intensity is the quantity of …….. flowing through a cross-section of the conductor in one ……..

6-The electric current is generated in……that are away from our houses by hundreds or thousands of kilometers

7-The joule is the amount of…….done by a force of one …….to move an object through a distance of one meter

8-When no current passes through a circuit, then the reading of the voltameter connected to a battery indicates……

9-The……..is used to measure the electric resistance

10-The ohm is the……of a conductor that has an electric current of intensity……..when the…….across its terminals is one volt.

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11-In the variable resistance, a……..is fixed on a thin rod of ……

12-The electric current intensity passing through a conductor is…….. proportional to the potential difference across it

13-When a current of intensity 5 ampere passes through a conductor of resistance 2 ohms, so the potential difference across its terminals equals ……

14-The mathematical formula of ohm's law is V = …… x ……

15-The types of electric resistance are…….and ……

16-When the current passes through a conductor with a resistance of 5 ohms and the potential difference across its terminals is 10 volts, then the current intensity is equal to…….

17-Electricity is used for several applications such as…… and……..

Give reasons:

1-The rheostat controls the current intensity flowing through the electric circuit

……

……

2-In the electric circuit, the ammeter is connected in series

……

……

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3-The voltameter is connected across the two poles of a battery

……

……

4-The current flows through the circuit only when it is closed

……

……

5-When two conductors have the same potential are connected, no electric current passes

……

……

Write the scientific term:

1-The quantity of electric charges flowing through a given cross-section of the conductor in one second (……..)

2-The measuring unit of quantity of electricity (……)

3-The amount of electric charges that flow through a conductor in a second (……..)

4-The work done by a force of one Newton to more an object through a distance of one meter (……..)

5-The obstruction of the electric current during its flow in the conductor (……)

6-A device used to measure the electric current intensity (……)

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7-Negatively charged particles that rotate around the nucleus (…….)

8-A resistance which is used to control the intensity of the electric current (……)

9-The ratio between the potential difference flowing through it across the terminals of a given conductor and the electric current intensity (…….)

10-The measuring unit of electric current intensity (……)

What will happens if and why ?

1-The circuit of ohm's law doesn't contain variable resistance

……

……..

2-The time of flowing the electric charges through a certain cross-section of a conductor is doubled

……

……

3-Two conductors having the same electric potential are connected together by a wire

……

……

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Worksheet (2) – unit (2)

Complete:

1-The name of the apparatus which its idea of operation depends on this work is…….., and it converts……energy into……..energy

2-Direct current can be transferred to……..distances, which alternating current can be transferred to……distances

3-There are two methods of connecting electric cells which are ……..and……..

4-In the simple cell, the……energy is converted into …….energy

5-Alternating current is used in……..and……..

6-Similar electric cells are connected in ……to obtain a high electromotive force and are connected in…….. to obtain an e.m.f. equal to one of them

6-The kinetic energy used in…….to obtain electric energy from electric power stations.

7-To obtain highest electromotive force, the electric cells are connected in……..

8-The group of similar cells which are connected in parallel make a battery of e.m.f. is…….than that of one cell

9-The electric current can be generated by two methods, which are …….and……..

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10-In …….connection, the positive poles are connected together, while…….poles are connected together

11-Chemical reactions method converts……..energy into ……energy

12-From the properties of the direct current is that it……..

Give reasons:

1-It is better to use the alternating current rather than the direct current

……

……

2-Some cells are connected in the electric circuit in series

……

……

3-The electromotive force of a battery whose cells are connected in series is greater than that one whose cells are connected in parallel

……

……

Put (√) or (X) and correct the wrong ones:

1-The current that is produced from dry cells is alternating current ( )

2-The e.m.f of a battery consists of similar cells connected in parallel is (nE) if each of them has the same e.m.f. ( )

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3-In the electric cell, the mechanical energy is converted into electric energy ( )

4-The idea of operation of dynamo is conversion the kinetic energy into electric energy ( )

5-The direct current can be transmitted for long distances ( )

6-Dry cells and batteries are from the sources of direct current ( )

Compare between each pair of the following:

1-Direct current & alternating current

.....

.....

.....

.....

.....

.....

2-Connection in series & connection in parallel

.....

.....

.....

.....

.....

.....

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Worksheet (3) – unit (2)

Complete:

1-The mass of the atom is concentrated in the……which contains……and……..

2-The energy stored in the atomic nucleus due to various forces is called ……..which is librated due to nuclear reactions

3-The……..force is very strong and it holds the protons and the neutrons together inside the……..

4-Radioactive materials are used as a nuclear……for ……..that fly in space.

5-Radiation pollution is the increase of the amount of…… in the……..

6-……sources of radiation pollution are due to explosion of nuclear bombs from time to time or due to…….

7-The composition of the atom is responsible for the…… and…….. properties of the element

8-……is the spontaneous conversion of atoms of some elements present in nature to reach a more stability

9-Establish laws for nuclear plants to cool the……..water before throwing it in the……and……

10-The radiation pollution due to the explosion in the Russian reactor at Chernobyl accident are……and……. Isotopes

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11-The maximum safe doses of nuclear radiation shouldn't exceed ……..for human in one……..

12-The area chosen for storing radioactive wastes should be……and don't exposed to……and……

13-The changes in the chemical composition of the…….. is from the……..effects due to exposure to radiation

14-The…….is the first in the human body which is affected by radiation causing decrease in the number of cells.

Give reasons:

1-Some elements are called radioactive elements

……

……

2-Radiation pollution occurs

……

……

3-Nuclear energy from radioactive sources is used in medical field

……

……..

4-The area chosen for storing radioactive wastes should be stable

……

……

5-The nuclei of radioactive elements are unstable

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……

……

6-Radioactivity has natural sources and also artificial

……

……

What is meant by ?

1-Isotopes

……

2-Radiation pollution

……

3-Cellular effects of radiation

……

4-Natural radioactivity

……

5-Radioactivity phenomenon

……

6-Nuclear energy

……

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Worksheet (1): Unit (3)

Complete:

1-There are two kinds of traits which are……and…….

2-Each pair of contrasting characters is called……pair, where one of the two characters is……and the other is…….

3-Mendel's first law is called the law of…….…….., while Mendel's second law is called the law of……...

4-In human beings, the individual who receives at least one dominant gene from either parents will has the……trait

5-Mendel used…….plant in his experiments

6-The skill of playing football is an example of……traits, while the skin color is an example of……..traits

7-In plants, male gametes are……and the female gametes are …….while in animals, male gametes are……and female gametes are……..

8-…….and……..are examples of dominant traits in human being, while……and…….are examples of recessive traits in human being.

9-The traits that don't transmit from a generation to another are the ……traits

10-The individual is called hybrid in the presence of……

11-The ratio of appearance of the dominant trait through the individuals of the first generation is……according to Mendel's first law.

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12-When a short stemed, white flowered pea plant is cross pollinated with a long stemed, purple flowered pea plant, all plants of first generation are ……..

13-The characterized ratio for the second generation in the law of independent assortment of hereditary factors is……..

14-According to Mendel's first law, the hereditary factors……. When gametes are formed.

Give reasons:

1-Mendel select the pea plant to conduct his experiments

……

……

2-the offspring is similar to his father in some characters and his mother in other ones

……

……

3-The disappearance of the recessive character in the individuals of the first generation in Mendel's experiments

……

……

4-When you pollinate a pure tall stemed pea plant with a short stemed pea plant, they produce plants all are tall stems

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……

……

5-The ability of bending the tongue is dominate trait in the human being

……

……

What is meant by ?

1-Gametes:

……

2-Dominant trait:

……

3-Hereditary traits:

……...

4-Acquired traits

……..

5-Genetics

……..

Compare between each pair of the following:

1-Dominant trait & recessive trait

……

……

……

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……

……

2-The individual of the first generation & the individual of the second generation in Mendel's experiments

……

……

……

……

……

3-Inherited trait & acquired trait

……

……

……

……

……

Put (√) or (X) and correct the wrong ones:

1-Straight hair is one of recessive traits in the human being ( )

2-Mendel assumed that hereditary trait are transmitted from a generation to another by means of genes ( )

3-The acquired traits are transmitted from one generation to another ( )

4-The first Mendel's law is called the free distribution of hereditary factors ( )

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5-Mendel chose seven contrasting traits in pea plant to conduct his experiments ( )

6-The hybrid individual has a dominant factor and recessive factor ( )

Problems:

1-A pea plant of pure tall stem pollinates another one of short stem. Explain on the bases of genetic principles, the genetic composition for the first and second generation

……

……

……

2-A pure black rat (BB) crosses a brown female (bb). Mention the colors and the ratios of resulted rats in the first and second generations explaining that on the basis of genetic principles.

……

……

……

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Scientists believe that drawing a map will help them to identify the genes responsible for the various diseases like cancer, diabetes, vascular, mental diseases, and to identify the various hereditary functions to the human

Worksheet (2) – unit (3)

Complete:

1-There are four types of nitrogenous bases in DNA molecule which are ……., ……., ……and……..

2-Genes are parts of……present in……..

3-Chromosome chemically consists of a nucleic acid called……. Combined with protein.

4-Genes are found inside the……..of each body cell

5-Mutations differ and change according to many factors as ……, inheritance, ……..and harmful or useful effect

6-……is the change in the nature of the hereditary factors that control the traits of a living organism which results in a change in the living organism's trait

7-……..mutation occurs in the body cells, while…….. mutation occurs in the reproductive cells

8-Most of mutations lead to the appearance of ……traits

9-When a nitrogenous base is replaced by another one in the code of three in the gene a……of another type is formed

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10-Every gene gives a special……that produces a…… showing a specific hereditary trait

11-The hereditary traits are transmitted from parents to their offspring through……

12-The……mutations produce new individuals with different traits

Give reasons:

1-DNA molecule consists of an infinite number of nucleotides

……

……

2-There is a specific code for the appearance of each hereditary trait

……

……

3-Some mutations are not transmitted from a generation to another

……

……

4-Man need to make some mutations artificially

……

……

5-Different genes produce different enzymes

……

……

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6-DNA molecule is called the double helix

……

……

Put (√) or (X) and correct the wrong ones:

1-Thymine base paired with cytosine base in DNA molecule ( )

2-Repetitive exposure to atomic rays produce spontaneous mutation ( )

3-The induced mutation leads to biotic variation ( )

4-Sterilization in plants is an example of the desirable mutations ( )

5-Mutation in the somatic cells is transmitted to offspring ( )

6-Spontaneous mutations occur without the interference of the human being ( )

7-The fetus inherits his genes from both parents ( )

8-The centrosome chemically consists of a nucleic acid connected with protein ( )

What is meant by ?

1-Nucleotides:

……

2-Somatic mutations:

……

3-Gamete mutations:

……..

4-Genes:

……

5-Chromosomes

……

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Worksheet (1) – unit (4)

Complete:

1-Hormones are secreted into the blood stream by……

2-……..., ……., two adrenal glands,……., two ovaries and two testes are considered the most important endocrine glands in the human body

3-……is a chemical message that controls and organizes most of the vital activities and functions in the body of living organism

4-The…….hormone produces the female secondary sex characteristics, while……..hormone produces the male secondary sex characteristics

5-Through the……mechanism, when blood sugar level gets lower than the normal, pancreas secretes……hormone

6-Cells disability to use glucose sugar is the main symptom of…….. disease, while the continuous growth of limb's bones is the main symptom of……..disease.

7-When the secretion of the growth hormone decreases at the childhood, man suffers from…….

8-The two hormones secreted by pancreas are……and……

9-Endocrine glands secrete more than……..hormones in the human body

10-Homeostasis means the…….. of the internal body environment

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11-On increasing thyroxin hormone level in the blood, it affects…….. gland to decrease its secretion of…….hormone, so thyroid gland decreases its secretion of thyroxin hormone

12-Thyroxin is a……..that regulates food assimilation in your body.

13-Pituitary gland is called the…….gland

14-The hormone which determines the height that the person will reach at adulthood stage is ……hormone

15-The hormone which stimulates the release of glucose sugar from liver is the……..hormone

Give reasons:

1-Blood stream is the only way for hormones to reach their sites of action

……

……

2-Pituitary gland is called the master gland

……

……

3-Man suffers from simple goiter disorder when his food lacks from iodine

……

……

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4-The stop of the body growth makes a person dwarf

……

……

5-The two adrenal glands have important role when man is exposed to emergency

……

……

6-The growth takes place to some person in the bones of their limbs which make them giants

……

……

Write the scientific term:

1-A gland located below the brain and it consists of two lobes, each one secrets various types of hormones (……..)

2-A hormone which produces female secondary characteristics (……)

3-Mechanism with which hormones work to achieve the internal balance in the human body (……)

4-A disease caused by the increase in the secretion of thyroxin hormone (……..)

5-A hormone disorder caused by the increase of secretion in the growth hormone at the childhood (……)

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6-The element that enters in the composition of thyroxin hormone

(……)

Mention the role of each of the following:

1-Pituitary gland

……..

2-Progestrone hormone

……..

3-Insulin hormone

……

4-Adrenaline hormone

……..

5-Pancreas

……

6-Parathormone hormone

……..

What would happen if ?

1-When human body needs energy

……

……

2-If the pancreas decreases its secretion of insulin hormone

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.....

.....

3-When man takes a little amount of iodine in his food

.....

.....

4-When testosterone hormone doesn't secreted at adulthood stage in a male human

.....

.....

Compare between each pairs of the following:

1-Insulin hormone & glucagon hormone

.....

.....

.....

.....

2-Adrinaline hormone & parathormone hormone

.....

.....

.....

.....

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Final Revision

Complete:

2- Organs which secrete hormones are called……..

2- When sodium reacts with water,……..gas rises.

3-In DNA molecule, the nitrogenous base guanine pairs with……base.

4-……..nitrate is used in the manufacture of sensitive camera films.

5-The change in the concentration of reactants and resultants in a time unit is ……

6-…….process if the reaction between an acid and alkali to form salt and water.

7-The Scientist……..is the founder of heredity, he used the seeds of ……..plant because its flowers are……..and thus it can be self pollinate.

8-The ability to roll the tongue is from the……traits, while the straight hair is from……..traits.

9-Nuclear energy is used in medicine to…….and…….. some diseases.

10-When the amount of iodine decreases in food, the secretion of…….. hormone decreases from the……gland.

11-The measuring unit of electric charges is……...

12-The…… agent is the substance which loses one electron or more during chemical reaction.

13-From the causes of spontaneous mutations are……..and…….

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14-Electric cells produce…….current, while the dynamo produces ……current.

15-During ……reactions the compound breaks up by heat into its simple components.

16-Calcium hydroxide is used in…….

17-The current intensity is measured by an apparatus called……and its measuring unit is……..

18-Pancreas secretes a hormone called……which reduces the level of sugar in the blood, and the decrease in its secretion causes…….disease.

19-Genes are found on the……, and the scientists……..and ……discovered the means of how the gene controls the appearance of the trait

20-The reaction of contributing compounds is…….

21-Te……element shares in composing thyroxin hormone.

22-The ammeter is connected in the electric circuit in……..,while the voltammeter is connected in……..

23-The DNA consists of small consecutive units called……and each one consists of a group of phosphate and……

24-The chromosome is chemically consisted of……..combined with ……..

25-$Cu(OH)_2 \xrightarrow{\Delta}$ ..... + …….

26-$2N_2O_5. \longrightarrow$ ……. + ……

27-$NaCl + CuSO_4 \longrightarrow$ ……+……

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28-Mutation in the……cells is transmitted to the offspring.

Give reasons:

1-Mendel choose the pea plant for his experiments.

……

……

2-Disappearence of the colour of copper sulphate solution after adding pieces of magnesium.

……

……

3-Pancreas is a double function gland.

……

……

4-A reddish brown precipitate is formed when magnesium is added to copper sulphate solution.

……

……

5-The usage of alternating current is preferred to the usage of direct current .

……

……

6-Reaction between ionic compounds are fast whereas, reactions between organic compounds are slow.

……

……

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7-Pituitary glands is called master gland.

.....

.....

8-The occurrence of effervescence on putting a piece of aluminum in diluted hydrochloric acid.

.....

.....

9-The voltammeter is connected to both poles of the battery in the electric circuit.

.....

.....

10-The height of some persons may reach less than half meter.

.....

.....

11-The ability of rolling the tongue is a dominant trait in the human being.

.....

.....

12-We should use the green leaves of vegetables in our food.

.....

.....

13-Magnesium can replace copper in its salt solution.

.....

.....

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14-The two adrenal glands have an important role when man is exposed to emergency.

……

……

15-The blood is the only way for the hormone to reach its site of action.

……

……

16-The nuclei of radioactive elements are unstable.

……

……

17-A black substance is formed when copper carbonate is heated.

……

……

18-Uranium is one of radioactive elements.

……

……

19-Rheostat is used in some electric circuits.

……

20-A white precipitate is formed when silver nitrate solution is added to sodium chloride solution.

……

……

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21-A certain mass of iron filings reacts with acids faster than the reaction of a block of iron have the same mass with acids.

……

……

22-The electromotive force (e.m.f) of a battery whose cells are connected in series is greater.

……

……

23-The areas chosen for storing radioactive wastes should be steady.

……

……

24-The curly hair trait dominates the smooth hair trait.

……

……

25-The electric energy is the cleanest source of energy.

……

……

26-Oxidation and reduction are concurrent processes.

……

……

<u>Put (√) or (×) and correct the wrong ones:</u>

1-Iron enters in the structure of thyroxin hormone. ( )

2-Volt is the measuring unit of the electrical resistance. ( )

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3-Green leaves of vegetables contain folic acid which is necessary for the proper growth of cells. ( )

4-The mutation which happens in the reproductive cells of the individual is not transmitted to the offspring. ( )

5-Dwarfism is a disease caused by decreasing of calcitonin hormone of the human body.( )

6-Calcium hydroxide is used in manufacture of anti-acidity stomach medicine. ( )

7-Genes are parts of DNA found in the cytoplasm of the cell.( )

8-Blood groups is considered as acquired traits. ( )

9-Mendel made a model of DNA structure. ( )

10-The blood sugar percentage increases if the pancreas stops secreting glucose hormone. ( )

11-If the potential difference between the two ends of a conductor =110 volt and the current intensity passing through the conductor is 0.1 ampere, the resistance of this conductor =1100 ohm. ( )

12-Mutation in the somatic cells is transmitted to offspring. ( )

13-The measuring unit of electric resistance is coulomb. ( )

14-Most metal carbonates decompose on being heated into non-metals and carbon dioxide gas. ( )

15-The solvent is the substance which is found with greater amount in the solution. ( )

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16-Increase of secretion in parathormone hormone causes exophthalmic goiter disease . ( )

17-The reaction between an acid and an alkali forming salt and water is called neutralization reaction. ( )

18-The arrangement of the metals in a descending order according to the rate of its chemical activity is called periodic table. ( )

19-The estrogen hormone releases the needed energy from the food. ( )

20-The gene mutation occurs as a result of the change in the nitrogenous bases of the gene. ( )

21-Hydrochloric acid reacts with sodium carbonate and a gas which turbid limewater is rising . ( )

22-Nuclear reactions which are done in nuclear reactors can't be controlled. ( )

23-Nitric acid is used in making car batteries. ( )

24-If the result of crossing between two individuals is 50% dominant and 50% recessive, this means that the parents are dominant. ( )

25-In the electric cell, the magnetic energy is converted into electric energy. ( )

26-The scientist Watson and Creek discovered the means of how the gene controls the appearance of a trait. ( )

27-The movement of temperature from hot object to a cold object depends on the difference between the amount of temperature in the two objects. ( )

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28-If two individuals bearing a pair or more of alternative traits are crossed, the trait of each pair is inherited independently of the others and appearance in the second generation at a ratio of 6:3. ( )

29-Sodium chloride is used in the manufacture of explosives and fertilizers. ( )

30-The mathematical relation of Ohm's law is R=V/I. ( )

What is meant by:

1-Direct electric current:

……

……

2-Hereditary traits:

……

……

3-Mutation:

……

……

4-Mendel's second law:

……

……

5-Chemical reactions:

……

……

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6-Diabetes:

……

……

7-Dwarfism in human beings:

……

……

8-Natural radioactivity:

……

……

9-The ohm:

……

……

10-The hormone:

……

……

Give one use of each of the following:

1-Sulphuric acid.

……

2-Calcium carbonate.

……

3-Adrenal hormone.

……

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4-The induced mutation.

……..

5-Ammeter.

……

6-Testosterone hormone.

……

7-Dynamo (electric generator).

……

8-Variable resistance (Rheostat).

……..

9-Potassium nitrate in industry.

……

10-Genes.

……

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2nd Term Science revision for prep3

Sheet (1)

[1] Choose:

1. When we heat metal oxide, we get ……

- Mercuric oxide & water **- Mercuric oxide & oxygen**

- Mercury & hydrogen **- Mercury & oxygen**

2. When copper hydroxide is heated, we obtain ……

- Copper carbonate & water **- Copper oxide & water**

- Copper oxide & hydrogen **- Copper & hydrogen**

3. When calcium carbonate is heated …… are obtained.

- Calcium bicarbonate & carbon dioxide - Calcium hydroxide & carbon dioxide

- Calcium oxide & carbon monoxide - Calcium oxide & carbon dioxide

4. Most metal sulphates decompose when heated to metal oxide and …… gas.

CO_2 – O_2 – So_2 – SO_3

5. On heating copper sulphate, a ……. Precipitate is formed.

Black – green – blue – reddish brown

6. Some metal nitrates are decomposed by heat into …….

Metal nitrite &oxygen gas **Metal nitrate & oxygen gas**

Nitrogen oxide & oxygen gas No correct answer

[2] Write the scientific term:

1. The breaking up of molecules of reactants and forming of new coherences in the molecules of the products{……}

2. Chemical reactions in which the compound is broken up into simpler one by the effect of heat. {……}

[3] Put (√) or (X), then correct:

1. Most metal carbonates decomposed by heating into metal oxide and CO_2. ( )

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[4] Complete:

1. Chemical reaction is a process involves ……. In the reactants molecules and formation of …….. in the product molecules.

2. During ……. Reactions, the compound is broken up by heat into its simpler components.

3. Copper hydroxide is decomposed by heat into …….. and …….

4. Most metal carbonates undergoes thermal decomposition into ……. and ……..

5. $2HgO \longrightarrow$ …….. + …….

6. $Cu(OH)_2 \longrightarrow$ …….. + ……..

7. $CuCO_3 \longrightarrow$ ……..+…….

8. $2NaNO_3 \longrightarrow$ …….. + …….

[5] Give reason for;

1. A black substance is formed on heating copper carbonate.

[7] What happens when:

1. Heating of red mercuric oxide.

2. Heating of blue copper sulphate.

Sheet (2)

[1] Choose:

1. Some metal can replace another one in the solution of these metals which …….

a. Follow it in chemical activity series b. Below it in chemical activity series

c. A&B are correct **d. No correct answer**

2. Active metals react with water as they substitute hydrogen of water which rises and produce ……..

Metal oxide – metal nitrate – metal hydroxide – metal nitrite

3. Zinc react with dilute hydrochloric acid and ……. Salt is formed.

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Zinc chloride – zinc sulphate – zinc nitrate – no correct answer

4. On heating copper turning to dilute hydrochloric acid, …….. is produced.

Copper hydroxide – copper carbonate – copper chloride – no correct answer

5. Potassium reacts with dilute hydrochloric acid forming ……. Salt.

Potassium nitrate – potassium sulphate – potassium chloride – no correct answer

6. The reaction between acid and alkali gives …….

Water &salt – salt &hydrogen – salt &oxygen

7. When potassium hydroxide reacts with dilute hydrochloric acid ……. are produced.

Potassium chloride &water – potassium sulphate &water -potassium oxide &water – all of the previous choices

8. Clear lime water turbid on passing ……. gas through it.

Nitrogen dioxide – sulphur dioxide – carbon dioxide

9. On heating silver nitrate solution to sodium chloride solution, a ……. Precipitate.

Blue – reddish brown – white – red

[2] Put (√) or (X), then correct:

1. The arrangement of metals in a descending order according to the rate of their chemical activity is called periodic table.( )

[3] Write the scientific term:

1. The arrangement of metallic elements in a descending order according to the rate of their chemical activity.{……}

2. A reaction where an element substitute another one in its salt solution.
{……}

3. Chemical reactions in which a change happens between the two radicals (ions) of the two compounds to form another two compounds. {……}

4. A reactions which involve double exchange between the ions of two compounds to form another two compounds.{……}

5. The reaction of acid and alkali to give salt and water.{……}

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[4] Complete:

1. The arrangement of metals in a descending order according to their chemical activity is called ……

2. Sodium reacts with water giving …… and …… gas evolves.

3. …… process is the reaction between an acid and an alkali to produce a salt and water.

4. On adding silver nitrate solution to sodium chloride solution, a ……. precipitate of ……. Is formed.

5. $2Na + 2H_2O \longrightarrow$ …….. + ……

6. $Zn + 2HCl \longrightarrow$ ……. + ……

7. $2Al +$ …… $\longrightarrow 2AlCl_3 +$ ……

8. $Mg + 2HCl \longrightarrow$ ……. + ……

9. ……. + ……. $\longrightarrow NaCl + H_2O$

10. $NaCl + AgNO_3 \longrightarrow$ ……. + ……..

[5] Give Reason for:

1. Copper doesn't react with dil. Hydrochloric acid.

2. Gold doesn't react with dilute acids.

3. The reaction between aluminum and dil. Hydrochloric acid takes a short time to start.

4. Magnesium substitutes copper in copper sulphate solution, while the opposite can't happened.

5. A reddish brown precipitate is formed when magnesium is added to copper sulphate solution.

6. The occurrence of effervescence on putting a piece of aluminum in dil. Hydrochloric acid.

substitution reaction.

Sheet (3).

[1] Choose:

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1. In the reaction :

$H_2 + CuO \longrightarrow Cu + H_2O$, the oxidizing factor is .....

H_2 – CuO – Cu – H_2O

2. The oxidizing agent is the substance which ..... during a chemical reaction.

Gives oxygen – removes hydrogen – loses hydrogen

3. The oxidation agent is the substance that .....

Gives oxygen – removes oxygen – gives hydrogen

4. Oxidation is a chemical process involves an increase in the percentage of ..... gas.

Helium – hydrogen – oxygen – fluorine

5. In the reaction :

$2Na + Cl_2 \longrightarrow 2NaCl$we can say that sodium (11Na) is a reducing factor because it .....

Units with oxygen – loses one electron – gains one electron – gains hydrogen

6. When sodium atom loses an electron from its outermost energy level, it becomes

Oxidized – reducing agent – reduced

[2] Put (√) or (X), then correct;

1. Reduction is a chemical process where the atom loses electron(s). ( )

2. Chloride ion is a negative ion as it loses an electron.( )

3. Sodium ion is positive ion (Na^+) as it accepts an electron.( )

4. Oxidation and reduction reaction take place separately.( )

[3] Write the scientific term:

1. A chemical process in which an atom of element gains one electron or more.
{.....}

2. A chemical process which causes the increase of the oxygen percentage or decrease in the hydrogen content.{.....}

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3. The substance which gives oxygen or takes hydrogen during a chemical reaction.
{.....}

4. The substance which takes oxygen or gives hydrogen during a chemical reaction.
{.....}

5. A substance which loses an electron or more during chemical reaction.
{.....}

[4] Complete:

1. On passing hydrogen gas over hot copper oxide, copper oxide is converted into .....

2. ..... agent is the substance which takes oxygen or gives ..... during a chemical reaction.

3. Oxidation is a chemical process where the atom ..... an electron or more.

4. ..... Agent is the substance which gains one electron or more during a chemical reaction.

5. Oxidation and reduction are two ..... Processes.

[5] Give reason for:

1. In the reaction :

$2Na + Cl_2 \longrightarrow 2NaCl$ Sodium is considered as a reducing agent, while chlorine is considered as an oxidizing agent.

[8] What happens if: Passing hydrogen gas over hot copper oxide.

[10] In the following reaction :

Copper oxide black + Hydrogen $\longrightarrow$ Copper + H2O

1. What happens to black copper oxide ?

2. What happens to hydrogen gas ?

3. Write the chemical equation which express the chemical reaction .

4. Why does black copper oxide act as an oxidizing agent and hydrogen gas act as a reducing agent ?

[11] In the following reactions:

Determine the oxidizing agent and the reducing agent and mention why ?

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1. $H_2 + CuO \xrightarrow{\Delta} H_2O + Cu$

2. $2Mg + O_2 \longrightarrow 2MgO$

3. $Mg + Cl_2 \longrightarrow Mg^{2+} + 2Cl^-$

Sheet (4)

[1] Choose:

1. At the beginning of the reaction, the percentage of reactants concentrations equals ..... **100% - 0% - 50%**

2. The speed of the reaction of oil with caustic soda is .....

Faster – relatively fast – slower – relatively slow

3, Factors that affect the speed of reaction are .....

Temperature of reaction – concentration of reactants – nature of reactants – all of the previous answers

4. Iron filings react with dilute hydrochloric acid faster than a piece of iron has the same mass due to the .....

Increase in concentration – presence of catalyst – increase in surface area – no correct answer

[2] Put (√) or (X), then correct;

1. The reactions of ionic compounds are slower than that of coordinate compound.( )

[3] Write the scientific term:

1. The change in the concentration of reactants and resultants in a time unit.

{.....}

[4] Complete:

1. Nitrogen pentoxide break up into ..... And ..... Gas.

2. At the beginning of the reaction, the concentration of reactants is ..... %.

3. The change in the concentration of reactants and resultants in a time unit is .....

4. The rate of chemical reaction depends on .....,.....,..... And .....

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5. The reaction of contributing compounds is ……..

6. Sodium chloride powder reacts ……. Than a cube of sodium chloride.

[5] Give reason for:

1. Reactions between ionic compounds are fast whereas, reactions between organic compounds are slow.

2. A certain mass of iron filings reacts with acids faster than the reaction of a block of iron mass with acids.

3. Using nickel filings in hydrating oil instead of pieces of nickel.

Sheet (5)

[1] Choose:

1.The rate of chemical reaction increased by rising temperature due to the ……..

- Increase in the number of collisions between reactants

- Presence of covalent or ionic bonds - Increase in the surface area

2. The substance which change the rate of the reaction without itself being changed is known as ……

Oxidizing agent – active agent – catalyst – reducing agent

3. Catalyst increase the rate of chemical reaction because it …

- Decreases the energy needed to start the reaction

- Combines with reactants then separates away to give the product.

- Doesn't chemically change

[2] Put (√) or (X), then correct:

1. The increase in the concentration of the reactants increases the number of collisions between molecules so that, the speed of reaction decreases. ( )

2. Rate of chemical reaction is increased by decreasing temperature. ( )

[3] Write the scientific term:

1. A substance which increases the speed of the chemical reaction without interfering in it or being consumed.{……}

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[4] Give reason for:

1. The speed of chemical reaction increases when the amount (concentration) of the reactants increases.

2. The rate (speed) of chemical reaction increases by heating.

3. The fridge is used to preserve food.

4. Catalyst is used in some chemical reactions.

[9] Mention the function of;

1. Refrigerator……

2. Catalyst in chemical reaction……

3. Enzymes in the human body……..

Sheet (6)

[1] Choose:

1. The ……. Is the measuring unit of the electric charges.

Coulomb – Ampere – Volt

2. The measuring unit of the electric current intensity is ……

Ampere – volt – ohm – coulomb

3. The ammeter is used to measure …….. in the electric current.

Potential difference – current intensity – resistance – e.m.f.

[2] Put (√) or (X), then correct:

1. The ampere is the charge transferred by a constant current of one ampere in one second. ( )

2. The measuring unit of electric current resistance is coulomb.( )

3. The ammeter measures the potential difference between the two ends of a conductor.

4. In the electric circuit, the ammeter is connected in parallel.( )

[3] Write the scientific term:

1. The flow of electric negative charges in a conducting material (metal wire)
{……}

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2. The electric current intensity passing through a circuit when a charge of one coulomb passes through a given cross section in one second. {……}

3. The current intensity produced by flowing one coulomb of electric charges in one second through a conductor.{……..}

4. The quantity of electric charges that flow through a conductor in a unit time. {……..}

5. A device used to measure the electric current intensity.{……}

[4] Complete:

1. The current intensity due to the flow of 2700 coulomb in 300 second through a cross section of a conductor equals ……

2. The …….. apparatus is used to measure the current intensity in units.

[7] Problems:

1. Calculate the electric current intensity that flows through cross section of a wire if a charge of 10 coulomb passes through 2 seconds.

2. Calculate the current intensity due to the flow of 5400 coulomb in 5 min. through a cross section of a conductor.

3. Calculate the quantity of electricity that flows in a wire if the current intensity passes through it is 18 amperes in a time of 7 minutes

Sheet (7).

[1] Choose:

1. For measuring the potential difference between two terminals of a conductor, we use …….. apparatus.

Pyrometer – barometer – voltmeter – ammeter

2. The …….. is used to measure the e.m.f. of a battery.

Voltmeter – ammeter -rheostat – ammeter

3. The unit that is used in measuring the electric resistance is ……..

Ohm – ampere – volt – coulomb

4. The ……. Is used to measure the electric resistance.

Ammeter – voltmeter – ohmmeter – rheostat

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5. The sliding rheostat is used to control ……. And …… in the electric circuit.

- Current intensity & potential difference - Resistance & potential difference

- Current intensity & resistance

6. The value of resistance of an electric conductor in an electric circuit is changed on changing …….

- Dimension of a conductor - Electric current intensity passing through it

- Potential difference between its terminals - Other electric circuit components

7. ……. Is the mathematical relation OF Ohm's law.

R=V/I – I=RV – R=VI – V=R/I

[2] Put (√) or (X), then correct:

1. The voltmeter is used to measure the electric resistance.( )

2. The electric current intensity passing through a conductor is inversely proportional to the potential difference between its ends at constant temperature. ( )

3. The resistance of a conductor that one ampere is passed through it when the potential difference between its terminals is 1 volt equals 10 ohm. ( )

4. If the potential difference between the two ends of a conductor is 3 volt, and an electric current intensity of one ampere passes through it, the resistance of a conductor is one ohm. ( )

[3] Write the scientific term:

1. The electric state of a conductor that show the transference of electricity from and to it. {……}

2. The value of the work done to transfer a unit of electric charge between two ends of a conductor.{……}

3. The potential difference across two poles of the battery when the circuit is open. {……}

4. The measuring unit of electromotive force of the electric cell. {……}

5. The opposition of the electric current during its flow in the conductor. {……}

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6. The resistance of a conductor that allows the passing of an electric current of 1 Ampere through it when the potential difference across its ends is 1 volt.
{……}

7. The instrument used in measuring the electric resistance.{……..}

8. The electric current intensity is directly proportional to the potential difference between two terminals of a conductor at constant temperature.{……..}

[4] Complete;

1. On connecting two charged conductors, the electric current passes from the conductor with …….. potential to the conductor of …….. potential.

2. …… is measured by voltmeter and has a measuring unit known as ……

3. In the electric circuits, the ammeter is connected In ……. ,while the voltmeter is connected in ……

4. The …….. is used to measure the electromotive force of a battery in unit known as ……

5. …….. apparatus is used to measure the resistance in the circuit.

6. The measuring unit of the resistance in the circuit is ……

7. The potential difference between the two terminals of a conductor is …….. proportional to the intensity of the current passing through it at constant temperature.

[5] Give reason for;

1. When two conductors have the same potential are connected, no electric current passes.

2. The voltmeter is connected across the two poles of a battery.

3. Rheostat is used in some electric circuits.

[7] What happens when …….. ?

1. The length of the rheostat wire increases .(to the electric circuit).

2. Potential difference between the terminals of a conductor is doubled at constant temperature. (for current intensity passing through it)

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[9] Problems:

1. Calculate the quantity of electricity that passes through a conductor of a resistance 2200 ohm for two minutes, when it is connected with a source of electric potential 220 volts.

2. Calculate the potential difference between the two ends of a vacuum cleaner whose resistance is 22ohms And current intensity passing through it is 10 Ampere.

3. If an electric current of 0.2 ampere passes in an electric heater and the potential difference between its two ends is 220 volts, calculate the heater resistance.

4. What is the quantity of electricity which passes through a conductor its resistance 1000ohm for 30 minutes when the potential difference across its ends is 220 volts.

[10] Draw the electric circuit used to achieve Ohm's law, then state Ohm's law and its mathematical relation.

Sheet (8)

[1] Choose;

1. Direct current can be produced from …….

Electrochemical cells – electric generator – electric power station - electric motors

2. In the simple cell, the …… Energy is converted into electric energy.

Kinetic – magnetic – chemical – mechanical

3. The direct current is used in …….

Lighting houses and streets – operating appliances – all of them

4. The direct current is produced from…….

Electric generators – electrochemical cells –electric power stations

5. From the properties of direct current is that …….

Has constant intensity only – changeable direction – constant intensity & direction

6. To generate an alternating current we use the ……..

Rheostat – dynamo – ammeter – ohmmeter

7. In dynamo, …… energy is converted into electric energy.

Magnetic - kinetic – chemical – light

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8. Alternating current is characterized by ……..

Constant intensity only – variable direction only – variable intensity & direction – variable intensity only

9. On connecting four electric cells, the e.m.f. of each one is 1.5 volts in series, the total e.m.f. of the new battery equals …….. volts.

(3 – 6 – 1.5 – 12)

[2] Put (√) or (X), then correct:

1. In electric cells and batteries, chemical energy is converted into electric energy.( )

2. In dry cell, magnetic energy is changed to electric energy.( )

3. Dynamo produces alternating current. ( )

4. Electric current in houses is always direct current( )

5. The e.m.f. of several cells which are connected in series is equal to e.m.f. of one cell. ( )

[3] Write the scientific term;

1. The electric current of constant intensity and direction.{……}

2. The electric current which is used in electroplating.{……..}

3. A type of connection of electric cells used to obtain high e.m.f.{……..…}

[4] Complete:

1. There are two types of electric current which are …… and ……

2. The electric current ge3nerated from a dynamo is due to convert …… energy to …… Energy.

3. Electric cell produces …… current, while the dynamo produces …… current.

4. The …… Electric current can be transported only for short distance.

[5] Give reason for:

1. It is better to use alternating current rather than the direct current.

2. Some electric cells are connected in electric circuits in series.

3. Some electric cells are connected in electric circuits in parallel.

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4. The electromotive force of a battery whose cells are connected in series is greater than that one whose cells are connected in parallel.

[8] What is the importance of ;

1. Dry cell 2. Dynamo 3. Direct current 4. Alternating current

[9] Show by drawing:

1. A diagram representing alternating current.

2. Connecting of three cells in series and also in parallel.

[10] Problems:

1. You have three similar cells, the electromotive force of each is 1.5 volt. Explain by using a diagram, how you can connect them to obtain an e.m.f. of :

a) 1.5 volts b) 3 volts c) 4.5 volts

2. You have four similar electric cells, the electromotive force of each one is 1.5 volt. Illustrate by drawing how can you connect them to get batteries of e.m.f. of :

a) 6 volts b)4.5volts c) 3volt in two ways d) 1.5 volt

3. If you have 4 dry cells the e.m.f. of each of the 1st & 2nd is 1.5 volts, the 3rd is 2 volts and the 4th is 3 volts.

Explain by drawing how can you connect them to obtain a new battery of e.m.f. equals :

a) 8 volts b) 6.5 volts

Sheet (9)

[1] Choose:

1. The radioactive phenomena was discovered by the scientist .....
(Ohm – Becquerel – Ampere – Volt)

2. ……. is a non-radioactive element.

Radium – Uranium – Zerconium – Iron

[2] Write the scientific term;

1. The process of conversion of atoms of some elements to reach more stability.
{……..}

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2. The natural spontaneous decaying of the atoms of some elements in nature as an attempt to reach a more stable composition. {.....}

3. The radiation and nuclear energy emitted during nuclear reactions that can be controlled and carried out at nuclear reactor. {.....}

4. Atoms of the same element with different number of neutrons and with the same number of protons.{.....}

[3] Complete:

1. Nuclear energy is used in medicine in ..... And ..... of some diseases.

2. Nuclear energy is used to convert sand to .....sheets to be used in manufacturing of ..... Appliances.

[4] Give reason for;

1. The nuclei of radioactive elements are unstable.

2. Some elements are called radioactive elements.

3. Uranium is one of radioactive elements..

4. Radioactivity has natural sources and also artificial sources.

[6] Mention the importance of ;

1. Radioactive elements in medicine.....

2. Nuclear energy in exploring space.....

3. Nuclear energy in drilling.....

4. Nuclear energy in agriculture.....

5. Nuclear energy in medical field:.....

Sheet (10)

[1] Choose;

1. The ..... effects the radiation is a result of changing the sex chromosomes of the cells. **(Physical – genetic – cellular – none of them)**

2. The measuring unit of absorbed radiation is .....(Curie – rem – rontgen – ohm)

3. Human being should not be exposed to radiation in amounts more than ..... Rem. **(5 – 3 – 8 – 10)**

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[2] Write the scientific term;

1. The changes that take place to the living organism due to its exposure to radiations. {……}

2. The measuring unit of absorbed radiation.{……..}

[3] Give reason for;

1. After Chernobyl accident, radioactive isotopes were found in the food products.

2. Radiation has genetic effects.

3. The areas chosen for storing radioactive wastes should be steady.

Sheet (11)

[1] Choose;

1. ……. Is considered as the founder of modern Genetics science.

Mendleef – Mendel – Mozely – Morgan

2. The …….. trait is always pure.

Acquired – hereditary – dominant – recessive

3. The result of the pollination between two pea plants, one hybrid yellow seeds and the other with green blue seeds is ……

100% green seeds – 100% yellow seeds – 50% green seeds & 50% yellow seeds.

[2] Put (√) or (X), then correct:

1. The acquired traits are transmitted from one generation to another. ( )

2. Mendel chose the bean plant to conduct his research.( )

3. The recessive trait is the trait that appears in all individuals of the 1st generation in Mendel's experiment. ( )

4. In the 1st law of Mendel, the two contrasting traits appear in the second generation by a ratio of 2 : 1. ( )

5. If the result of crossing between two individuals is 50% dominant and 50% recessive, this means that the parents are dominant. ( )

[3] Write the scientific term:

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1. The traits ready to be transmitted from one generation to another.
{……}

2. The traits that are not transmitted from one generation to another.
{……}

3. The branch of science that aims to explain how different characteristics transfer through generation.{……}

4. A science that researches the transmission of the hereditary traits from one generation to another by studying the similarities and differences between the parents and the offspring. {……}

5. The trait that appears in all individuals of the 1st generation in Mendel's experiments. {……}

6. The appearance of a hereditary trait in the individuals of the 1st generation when two individuals are crossed, one of them carrying a pure hereditary trait contrasting by a trait carried by the other individual. {……}

7. Through which the hereditary traits are transmitted from parents to offspring.
{……}

8. The individual who carries a contrasting pair of genes, one is dominant and the other is recessive. {……..}

[4] Complete:

1. …….. science researches the transmission of hereditary traits from parents to the offspring.

2. …… traits are not transmitted from one generation to another.

3. The scientist ……. Is the founder of heredity, he used the seeds of …….. plant, because its flower are …… and thus it can self - pollinate.

4. During Mendel's experiments , he removed the stamen from the flowers before they become mature to prevent ……. Pollination, and he covered some flowers to prevent …….. pollination.

5. The trait that appears in all individuals of the 1st generation in Mendel's experiment is …….. trait.

[5] Give reason for:

1. Learn to walk in children is not considered a genetic trait.

2. The skill of playing basketball isn't hereditary trait.

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3. Mendel selected (chose) the pea plant to conduct his experiments.

4. Mendel removed the stamens from flowers of the plant before the anther becomes mature.

5. Mendel covers the stigmas of the pistils of pea flower during the study of hereditary traits.

6. Mendel let pea plants for self- pollinate for several generations.

7. When a pure yellow pod pea plant is pollinated with pure green pod pea plant, they produce plants that all are with green pods.

8. When you pollinate a pure tall stemed pea plant with a short stemed pea plant , they produce all plants tall stemed.

[7] What happens when.....?:

1.Mendel didn't remove the stamens of the flowers of the pea plant that produces yellow seeds.

2. Pollination of peas flowers of hybrid yellow seeds with each other.

3. A dominant gene exists with a recessive one.

[9] Problems;

1. If crossing takes place between two pea plants , one of them of hybrid red flowers and the other of pure white flowers. Explain on the bases of genetic principles , the results of such crossing. Mention the ration of the obtained offspring.

2. In pea plant, what are the results of self-pollination of tall hybrid plat pure, by using the symbols (T,t) showing (parents – gametes – offspring)

3. Using the symbols to express the results of mating between a short stemed pea plant (tt) and a long stemed pea plant (TT).

4. If crossing takes place between two pea plants, one with pure red flowers and the other with white flower, explain on genetic bases the result of crossing between one of the 1st generation with plant of white flowers.

N.B. The red flower is symbolized by ® & the white flower is symbolized by (r)

5. When a pea plant that has tall stem is crossed with a pea plat that has short stem, this crossing produced individuals with the ratio of 50% tall : 50 % short.

What is the genetic structure of parents and producing individuals (use "T" for tall "t" for short.

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6. If a black mouse BB is crossed to brown female mouse (bb). Mention the colors and ratios of the resulting offspring in the 1st generation and second generation . Illustrate on hereditary basis.

7. Mendel placed a group of assumptions (hypotheses) to explain the appearance of the dominant trait and the disappearance of the recessive trait in the first generation in the experiments that he carried with the pea plant. Explain these assumptions (briefly).

8. State the contribution of the scientist Mendel.

Sheet (12)

[1] Choose:

1. Which of the following trait is dominant in human being.

Smooth hair – blue colored eyes – attached ear lobe – absence of freckles

2. Which one of these traits is recessive in humans ?

Curly hair – Wide eye – Free ear lobe – straight hair

[2] Put (√) or (X), then correct;

1. When two individuals differ in two pairs or more of alternative traits copulate the trait of each pair is inherited together and appears in the second generation at ration 3:1.( )

2. The ability to turn the tongue in a tube shape is dominant trait in human. ( )

[3] Write the scientific term:

1. The individual who carries a contrasting pair of genes, one is dominant and the other is recessive.{……..}

2. When two individuals bearing a pair or more of alternative (contrasting) traits are crossed, the trait of each pair is inherited independently of the others and appears in the second generation at a ratio of 3:1. {……}

[4] Give reason for:

1. The curly hair trait dominates over the smooth hair trait.

2. The ability of rolling a tongue is dominant in the human being.

3. The free ear lobe is dominant over the attached ear lobe.

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[6] Problem:

1. Explain on genetic principles the genetic composition of the individuals resulting from crossing a pea plant with short stem (tt) with a hybrid red flowers with another one hybrid tall stem and white flowers.

- Tall stem is symbolized by (T) - The red color is symbolized by (R)

2. What result is based on ? when two pea pure plants are crossed, one of them of long stem and red flowers and the other of short stem and white flowers for traits in the 1st generation plants.

3. Explain by experiment to explain the law of independent assortment of hereditary factors.

Sheet (13)

[1] Choose:

1. …… put the model of DNA molecule. **(Ohm – Mendel – Watson – Johansson)**

2. …….. is the part of DNA in the cell nucleus. **(Gene – Gamete – Cytoplasm)**

3. ……. Is chemically composed of nucleic acid and DNA combined with protein.

(Cytoplasm – Chromosome – Gene)

[2] Put (√) or (X), then correct:

1. Genes are parts of DNA found in the cytoplasm of the cell. ( )

2. The chromosome chemically consists of a nucleic acid connected with protein.( )

3. Mendel made a model of DNA structure. ( )

[3] Give the scientific term;

1. Parts of DNA that are present on the chromosomes and carry the hereditary traits of the individual.{……}

2. It is chemically consisted of a nucleic acid called DNA combined with protein.
{……}

[4] Complete:

1. Chromosome is chemically composed of nucleic acid called …… which is combined with ……

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2. The two scientists ……. And ……. were able to make model for DNA molecule.

3. The DNA consists of small consecutive units called …… .

5. The two scientists ……. And …….discovered the means of how the gene controls in the appearance of the trait.

[6] Explain how the gene perform their function ?

Sheet (14)

[1] Choose;

1. The hormone which regulates the level calcium in the blood is ……

Calcitonin – thyroxin – progesterone – adrenalin

2. Calcitonin hormone is secreted from ……..

Pancreas – thyroid gland – pituitary gland – parathyroid gland

3. The …….. hormone liberates the needed energy from the food stuff.

Growth – estrogen – thyroxin – testosterone

4. The hormone which its deficiency causes the enlargement of the thyroid gland is ……..

Estrogen – insulin – thyroxin – glucagon

5. The hormone that stimulates the release of glucose sugar from liver is the ……. hormone.

Thyroxin – insulin – parathormone – estrogen

6. Glucagon hormone is secreted by …….

Pituitary gland – thyroid gland – adrenal gland – pancreas

7. The hormone which stimulates the body's organs to respond for emergencies is …….

Insulin – glucagon – estrogen – adrenalin

8. The hormone responsible for the appearance od secondary sexual male characters is the ……. hormone.

Progesterone – testosterone – adrenalin – growth

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9. The gland which secretes testosterone hormone is called ……

Pituitary gland – the two testes – thyroid gland – the two ovaries

10. The hormone responsible for the appearance of the female secondary sex characters is the ……. Hormone.

Parathormone – estrogen – insulin – testosterone

[2] Put (√) or (X), then correct:

1. Hormones are secreted by the duct glands ( )

2. Pituitary gland secretes a hormone that organizes the growth of the body.( )

3. Thyroid gland secretes a hormone that organizes the growth and development of sexual organs in the human body.( )

4. Dwarfism is the continual growth of human limb's bones, so the person becomes a giant. ( )

5. The calcitonin hormone controls the level of calcium in the human body.( )

6. The glucagon hormone is secreted by pituitary gland.( )

7. The iron element shares in composing thyroxin hormone.

8. The adrenal gland secretes parathormone hormone which stimulates body's organ to respond to emergencies. ( )

9. Exophthalmic goiter is resulted due to thyroxin hormone deficiency. ( )

10. Feedback is the mechanism with which hormones act in the human body.( )

[3] Give the scientific term:

1. Organs secreting hormones in the human body.{……..}

2. They are ductless glands that secretes their hormones directly in the blood without passing through ducts.{……..}

3. A chemical message that controls and regulates the activities and functions of most of the body organs.{……}

4. A gland secretes a hormone that regulates the growth of the human sexual organs. {……}

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5. A hormone which stimulates body's organs to respond emergencies.

{.....}

6. A hormone which stimulates the storage of glucose sugar in liver.

{.....}

7. A hormone which appears the female secondary sex characters.

{.....}

8. Mechanism with which hormones act to achieve the homeostasis in the human body.

{.....}

9. The result when one of the endocrine glands does not act properly.

{.....}

[4] Complete:

1. A chemical substance that controls and regulates the functions of most of body organs is known as ……..

2. Hormones are directly secreted into the blood stream by ……..

3. …….. gland secretes …… hormone which controls the general growth of the body.

4. Deficiency of …….. hormone during ……. stage causes dwarfism.

5. Thyroxin is a ……. That regulates food stimulation in your body.

6. When the amount of iodine decreases in the food, the secretion of the ……. Hormone decreases from …….. gland.

7. When the amount of glucose sugar decreases in the blood , pancreas secretes …… hormone

8. The …… hormone is secreted when the rate glucose sugar increases in the blood.

9. When glucose level increased in the blood , the pancreas secretes hormone which stimulates the body's cells to absorb ……. From the blood.

10. Deficiency of insulin hormone secretion causes ……

[5] Give reason for:

1. Endocrine glands are called by this way.

2. Blood stream is the only way for hormones to reach their sites of action.

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3. Pituitary gland is called master gland.

4. Pituitary gland plays an important role in delivery and breast feeding process.

5. The height of some persons may exceed 2 meters.

6. The height of some persons may reachless than half meter.

7. The limb's bones of some people grow continuously, so they become giant.

8. The stopping of the body growth , so the person becomes a dwarf.

9. Thyroid gland plays an important role in controlling the level of calcium in the blood.

10. The two adrenal glands have an important role when man is exposed to emergency.

11. Pancreas is a double function gland.

12. Diabetes disease is treated with insulin hormone.

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Questions

Unit (1)

(1) Complete the following:

1) Nitrogen pentoxide breaks up into …….. and …….. gas.
2) At the beginning of the reaction, the concentration of reactants is ……...
3) The speed of a chemical reaction can be measured practically by the rate of …….. of reactants or the rate of …….. of resultants.
4) The change in the concentration of reactants and resultants in a time unit is ……...
5) The rate of chemical reaction depends on …….., ……..., ……..and ……...
6) The reaction of contributing compounds is ……...
7) The increase in concentration of reactants makes the chemical reaction ……...
8) A substance which increases the chemical reaction without sharing in the reaction is ……...
9) $2NaOH + CuSO_4 \rightarrow$ …….. + ……..
10) $Fe + 2HCl \rightarrow$ …….. + ……..
11) $2N_2O_5 \rightarrow$ …….. + ……..

(2) Give reasons for:

1) The speed of chemical reaction increases when the amount of the reactants increases.
2) Food must be heated during its preparation.
3) Food goes rotten in summer days if it is not frozen.

(3) How can you differentiate between:

Sodium chloride solution and sodium hydroxide solution (by two different methods)

(4) Mention the function of:

1- refrigerator 2- Enzymes

(5) Complete the following:

1- …….. is the mixture that is homogenous in …….. and properties.

2- It is possible to dissolve more solute in the …….. solution.

3- An excess of the solute cannot be dissolved in …….. solution.

4- The amount of the solute in saturated solution is …….. than that in super-saturated solution.

5- The aqueous solution of an acid contains …….. ions, while that of a base contains …….. ions.

6- Acids change the …….. litmus paper into …….. .

7- Acids react with …….. to give …….. and water.

8- Most bases have …….. feel like ……...

9- …….. acid is produced in human muscles during physical exericises.

10- Calcium carbonates is used in the manufacture of …….. and ……...

11- Silve nitrates are used in the manufacture of sensitive ……...

(6) Mention one use for each:

1- Hydrochloric acid

2- Magnesium hydroxide

(7) Give reason for:

1- Sodium and potassium minerals have a role in the human body.

2- The green leaves of vegetables have a great benefit.

3- The molten of coinage metals is considered as a type of solution.

4- The rheostat are used in the electric circuit.

(8) Define:

- Ohm's law

(9) What's meant by:

- A work of 10 joules is done to transfer a charge of 5 coulombs between two points.

(10) Solve: If the quantity of electricity of 12 coulombs passes through a cross-section of a conductor in 3 seconds, what is the intensity of the current passing through that conductor?

Unit (2)

(1) Complete:

1- The current intensity due to the flow of 2700 coulomb in 300 second through a cross-section of a conductor equals ……

2- In the electric circuits, the ammeter is connected in ……, while the voltmeter is connected in ……

3- Volt = $\frac{\text{joule}}{\ldots\ldots\ldots\ldots \times \text{second}}$

4- There are two types of electric current which are …… and ……

5- The …… electric current can be transported only to short distance.

6- There are two methods of connecting electric cells which are …… and ……

7- ……, …… and cesium are natural radioactive elements.

8- Nuclear energy is used in medicine in …… and …… of some diseases.

(2) Write the scientific terms:

1- The flow of electric negative charges in a conducting material (metal wire). (……)

2- A device used to measure the electric current intensity. (……)

3- The work done to transfer unit of electric charge between two ends of a conductor. (……)

4- The opposition to the flow of electric current in the conductor. (……)

5- The potential difference across the two poles of the battery when the circuit is opened. (……)

6- The electric current of constant intensity and direction. (……)

7- A type of connection of electric cells used to obtain high e.m.f. (……)

8- The process of conversion of atoms of some elements to reach more stability. (……)

9- The changes that take place to the living organism due to its exposure to radiations. (……)

(3) Choose the correct answer:

1- Electrons are …… charged particles.

a) positively b) neutral

c) negatively d) no correct answer

2- …… is the measuring unit of the electric charges.

a) coulomb b) Ampere

c) volt d) no correct answer

3- …… is used to measure the e.m.f of a battery.

a) Voltmeter b) Ammeter c) Rheostat d) ohmmeter

4- …… is the measuring unit of electric resistance.

a) ohm b) ampere c) volt d) coulomb

5- As the length of rheostat wire increases, the current intensity ……

a) increases b) decreases

c) constant d) there is no answer

6- Direct current can be produced from ……

a) electrochemical cells b) electric generators

c) electric power stations d) electric motors

7- In the simple cell the …… energy is converted into electric energy.

a) kinetic b) magnetic c) chemical d) mechanical

8- In dynamo, …… energy is converted into electric energy.

a) magnetic b) kinetic c) chemical d) light

9- Alternating current is used in ……

a) electrolysis b) lighting house

c) electroplating d) both a & c

10- Radioactive phenomenon was discovered by the scientist ……

a) ohm b) Becquerel c) Ampere d) volt

11- Rockets use …… fuel for flying

a) gasoline b) kerosene c) natural gas d) nuclear

12- The measuring unit of the absorbed radiation is the ……

a) curie b) rem c) Rontgen d) ohm

(4) Give reasons for:

1- It is better to use alternating current rather than direct current.

2- The voltmeter is connected across the two poles of a battery.

3- Rheostat is used in some electric circuits.

4- Some cells are connected in electric circuit in series.

5- Some cells are connected in the electric circuit in parallel.

6- e.m.f. of battery whose cells are connected in series is greater than that connected in parallel.

7- Some elements are called radioactive elements.

8- Radiation has genetic effect.

(5) Problems:

1- Calculate the electric current intensity that flows through cross section of a wire, if a charge of 10 coulombs passes through in 2 seconds.

2- Calculate the current intensity due to the flow of 5400 coulomb in 5 min. through a cross-section of a conductor.

3- What is the quantity of electricity which passes through a conductor its resistance 100 ohm for 30 minutes when the potential difference across its ends is 220 volts.

4- You have three similar cells, the electromotive force of each is 1.5 volt. Explain by using a diagram how you can connect them to obtain an e.m.f of:

a) 1.5 volts b) 3 volts c) 4.5 volts

Unit (3, 4)

(1) Complete:

1- …….. traits are not transmitted from one generation to another.

2- The scientist …….. is the founder of heredity, he used the seeds of …….. plant, because its flowers are …….. and thus it can self-pollinated.

3- The trait that appears in all individuals of the first generation in Mendel's experiments is …….. trait.

4- Chromosome is chemically composed of a nucleic acid called …….. which is combined with ……..

5- The two scientists …….. and …….. were able to make a model for DNA molecule.

6- In DNA molecule, the nitrogenous base, Guanine pairs with …….. base.

7- The gene mutation occurs as a result of the change in the sequence of …….. of the gene.

8- Hormones are directly secreted into the blood stream by ……..

9- …….. gland secretes …….. hormone which controls the general growth of the body.

10- Thyroxin is a …….. that regulates food assimilation in your body.

(2) Write the scientific term:

1- The traits ready to be transmitted from one generation to another. (……)

2- The trait that appears in all individuals of the first generation in Mendel's experiments. (……)

3- The hereditary factors which transmit traits from the parents to off spring. (……)

4- Through which the hereditary traits are transmitted from parents to offspring. (……)

5- Parts of DNA that are present on the chromosomes and carry the hereditary traits of the individual. (……)

6- It is chemically consisted of a nucleic acid called DNA combined with protein. (……)

7- The mutations which are controlled by human to obtain desirable traits in specific living organisms and specially in the plants. (……)

8- Organs secreting hormones in the human body. (……)

9- A chemical message that controls and regulates the activities and functions of most of the body organs. (……)

10- Hormone which stimulates the storage of glucose sugar level in the blood. (……)

11- The result when one of the endocrine glands does not act properly. (……)

(3) Choose the correct answers:

1- Mendel conducted his experiments in pea plant by using ..... pairs of traits.

a) 5 b) 7 c) 9 d) 11

3- The two factors of a hereditary trait are similar in the ..... individual.

a) pure b) hybrid c) recessive d) a and c

4- Which one of these traits is recessive in humans .....

a) curly hair b) wide eyes c) free ear lobe d) straight hair

5- ..... put the model of DNA molecule.

a) ohm b) Mendel c) Watson d) Johansson

6- ..... is the part of DNA in the cell nucleus.

a) Gene b) Gamete

c) Cytoplasm d) no correct answer

7- DNA molecule consists of ..... strands.

a) two b) three c) four d) five

8- The ..... mice don't have melnin pigment.

a) grey b) white c) black d) brown

9- The hormone which regulates the level of calcium in the blood is the ..... hormone.

a) calitonin b) thyroxin

c) progesterone d) adrenalin

10- The ..... hormone liberates the needed energy from the food stuff.

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c) thyroxin d) testosterone

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(5) Problems:

1- In pea plant, what are the results of self-pollination of tall hybrid plant pure, by using the symbols (T, t) showing (parents – gametes – offspring).

2- Using symbols to express the results of mating between a short stemed pea plant (tt) and a long stemed pea plant (TT)

3- If a black mouse BB is crossed to a brown female mouse (bb) mention the colours and the ratios of resulting offspring in the first generation and second generation illustrated on hereditary basis.

4- When a pea plant that has tall stem is crossed with a pea plant that has short stem, this crossing produced individuals with the ratio of 50% tall : 50 % short what is the genetic structure of parents and producing individuals (use “T” for tall “t” for short)

Model Answers

(1) Complete the following:

1) Nitrogen pentoxide breaks up into **nitrogen dioxide** and **oxygen** gas.
2) At the beginning of the reaction, the concentration of reactants is **100%** .
3) The speed of a chemical reaction can be measured practically by the rate of **disappearance** of reactants or the rate of **appearance** of resultants.
4) The change in the concentration of reactants and resultants in a time unit is **the speed of chemical reaction**.
5) The rate of chemical reaction depends on **temperature**, **catalysts**, **concentration of reactants** and **nature of reactants**.
6) The reaction of contributing compounds is **slow**.
7) The increase in concentration of reactants makes the chemical reaction **faster**.
8) A substance which increases the chemical reaction without sharing in the reaction is **catalyst**.
9) $2NaOH + CuSO_4 \rightarrow$ **Na_2SO_4** + **$Cu(OH)_2 \downarrow$**
10) $Fe + 2HCl \rightarrow$ **$FeCl_2$** + **$H_2\uparrow$**
11) $2N_2O_5 \rightarrow$ **$4NO_2$** + **$O_2\uparrow$**

(2) Give reasons for:

1) The speed of chemical reaction increases when the amount of the reactants increases.

Due to the increase in the number of collision between molecules.

2) Food must be heated during its preparation.

To increase the speed of chemical reaction which help in cooking of food.

3) Food goes rotten in summer days if it is not frozen.

Due to the increase of the speed of chemical reaction done by bacteria.

(3) How can you differentiate between:

Sodium chloride solution and sodium hydroxide solution (by two different methods)

The first method: by adding silver nitrate solution if white ppt. is formed.

∴ the solution is sodium chloride:

$NaCl + AgNO_3 \rightarrow NaNO_3 + AgCl \downarrow$ white ppt

The second method: by adding copper sulphate solution if blue ppt is formed.

∴ the solution is sodium hydroxide:

$2NaOH + CuSO_4 \rightarrow Na_2SO_4 + Cu(OH)_2 \downarrow$

(4) Mention the function of:

1- refrigerator : preservation of food

2- Enzymes : they control digestion of food

(5) Complete the following:

1- **Solution** is the mixture that is homogenous in **composition** and properties.

2- It is possible to dissolve more solute in the **unsaturated** solution.

3- An excess of the solute cannot be dissolved in **saturated** solution.

4- The amount of the solute in saturated solution is **less** than that in super-saturated solution.

5- The aqueous solution of an acid contains **H^+** ions, while that of a base contains **OH^-** ions.

6- Acids change the **blue** litmus paper into **red**.

7- Acids react with **bases** to give **salt** and water.

8- Most bases have **soapy** feel like **NaOH**.

9- **Lactic** acid is produced in human muscles during physical exericises.

10- Calcium carbonates is used in the manufacture of **glass** and **cement**.

11- Silver nitrates are used in the manufacture of sensitive **camera film**.

(6) Mention one use for each:

1- Hydrochloric acid: in detergents and polishing metals surfaces needed to be coated

2- Magnesium hydroxide: in the manufacture of antacids.

(7) Give reason for:

1- Sodium and potassium minerals have a role in the human body.

Because they are responsible for the transfer of nerve impulses.

2- The green leaves of vegetables have a great benefit.

Because they contain folic acid which is necessary for the proper growth of cells.

3- The molten of coinage metals is considered as a type of solution.

Because the coin is an alloy of copper dissolved in silver in a homogenous form.

4- The rheostat are used in the electric circuit.

To control the electric current intensity flowing through the circuit.

(8) Define:

Ohm's law: the electric current intensity passing through a conductor is directly proportional to the potential difference across it at constant temperature.

(9) What's meant by:

- A work of 10 joules is done to transfer a charge of 5 coulombs between two points.

This means that the potential difference across the two points equals 10 / 5 = 2 volt

(10) Solve: If the quantity of electricity of 12 coulombs passes through a cross-section of a conductor in 3 seconds, what is the intensity of the current passing through that conductor?

Solution: $I = \frac{q}{t} = \frac{12}{3} = 4$ amperes.

Unit (2)

(1) Complete:

1- 13.5 Amp.

2- series, parallel

3- volt = $\frac{\text{joule}}{\text{coilomb} \times \text{second}}$

4- direct – alternating

5- direct

6- series – parallel

7- radium, uranium

8- treat & diagnose diseases

(2) Write the scientific terms:

1- electric current

2- Ammeter

3- potential difference

4- resistance

5- e.m.f

6- direct electric current

7- series connection

8- radioactivity

9- mutation

(3)

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

(4) Give reasons for:

1- because it can be transferred to long distances & can be converted to direct current.

2- To measure e.m.f. of battery.

3- To control the current intensity passing through the circuit & potential difference by changing the resistance.

4- To obtain high e.m.f

5- To obtain low e.m.f.

6- because the total e.m.f. for a group of cells connecting in series is equal to the sum of the e.m.f for these cells, while the total e.m.f for a group of cells connecting in parallel is equal to the e.m.f of one cell.

7- because their nucleus contain number of neutrons more than that required for its stability.

8- because it changes sex chromosomes composition results in abnormal birth.

(5)

1) $q = 10$ coulmbs $\quad t = 2$ sec.

$I = \frac{q}{t} = \frac{10}{2} = 5$ Ampere .

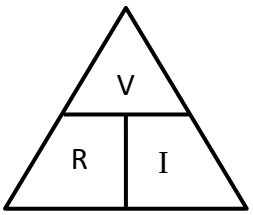
2) $= 5400$ colomb $\quad t = 5 \times 60 = 300$ sec .

$I = \frac{q}{t} = \frac{5400}{300} = 18$ Ampere .

3) $R = 100$ ohm $\quad , t = 30 \times 60 = 180$ sec.

$, V = 220$ v , $R = \frac{V}{I}$, $I = \frac{V}{R}$

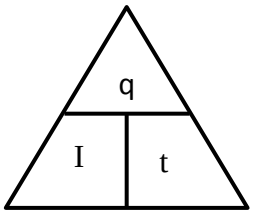
$\therefore I = \frac{220}{100} = 2.2$ Ampere .



$\because q = I \times t$

$= 2.2 \times 1800$

$= 3960$ coulomb .



(Unit 3 , 4)

(1)

1 – Acquired .

2 – Mendel , Peaplant , hermaphodite .

3 – Dominant .

4 – DNA , protien .

5 – Watson & creck .

6 – Cytosine (c) .

7 – nitrogeueus bases .

8 – endocrine glands .

9 – Pituitary – growth .

10 – Thyroxine hormone .

11 – hormone .

(2)

1 – Hereditary traits .

2 – Dominant trait .

3 – genes .

4 – hereditany factor (genes).

5 – genes .

6 – chromosomes .

7 – Induced mution .

8 – endocrine glands .

9 – hormone .

10 – Insulin .

11 – hormone disorder .

(3)

1 – 7

2 – pure

3 – straight hair .

5 – watson

6 – Gene

7 – 2

8 – white

9 – (a)

10 – (c)

11 – (d)

Questions

(1) Complete the following:

1- Most metal sulphates undergo thermal decomposition to give ..... and .....

2- The chemical activity series is the arrangement of metallic elements in a ..... order according to their ..... .

3 Chemical reaction is the process in which bonds in reactants are ..... and bonds in ..... are formed.

4- Oxidation and reduction are two ..... processes.

5- The substance that gives oxygen and removes hydrogen is called .....

6- In the following reaction: $2Mg + CO_2 \xrightarrow{\Delta} 2MgO + C$ the oxidizing agent is ..... while the reducing agent is .....

(2) Choose the correct answer:

1- When dilute hydrochloric acid is added to calcium carbonate ..... gas is evolved.

a) CO_2 b) H_2 c) O_2 d) CO

2- A process that involves the splitting of compounds into simpler compounds by the effect of electricity is called .....

a) simple substitution b) thermal decomposition
c) electrolysis d) direct combination

3- The blue colour of copper sulphate disappears and ..... is formed by heating.

a) black ppt b) red colour c) yellow ppt d) black colour

4- The following elements can replace hydrogen in dilute acids except ..... element.

a) Magnesium b) zinc c) copper d) sodium

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5- The oxidizing agent is the compound which ..... during the chemical reaction.

a) loses hydrogen b) gains oxygen

c) loses oxygen

6- The percentage of hydrogen increases during ..... reactions.

a) neutralization b) oxidation

c) reduction d) substitution

7- In the reaction between sodium and chlorine to form sodium chloride, the oxidizing agent is .....

a) sodium b) chlorine

c) sodium chlorine d) both sodium and chlorine

(3) Put(√) or (x):

1- Metallic elements are arranged in an ascending order according to their chemical activity in the C.A.S. (.....)

2- No reaction takes place between copper and zinc sulphate. (.....)

3- Anhydrous copper sulphate decomposes by heat to give copper oxide and sulphur dioxide. (.....)

4- Reduction means gaining of hydrogen . (.....)

(4) Write the scientific term:

1- A process of splitting compounds into simpler compounds by the effect of heat. [.....]

2- The arrangement of metallic elements according to decreasing chemical activity. [.....]

3- A process in which an element displaces another element in one of its salt solution. [.....]

4- It is the double exchange between the radicals of two compounds to give two other new compounds. [.....]

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5- A reaction between acid and alkali to give salt and water.

[.....]

6- A chemical substance which helps to increase the speed of the reaction but does not change itself. [.....]

7- The chemical process which leads to the increase of oxygen or decrease of hydrogen. [.....]

8- Two processes take place at the same time during the chemical reaction [.....]

9- A substance which gains one or more electrons during a chemical reaction. [.....]

10- The chemical process in which the atom of the substance gains one electron or more during the chemical reaction. [.....]

(5) Give reason for:

1) When a magnesium strip burns in air a white powder is formed.
2) Silver element does not react with dilute sulphuric acid .
3) Formation of silvery material on heating red mercuric oxide.
4) Oxidation and reduction are two complementary processes in the same chemical reaction.

(6) What is the effect of heat on the following?(by equation)

1- Copper sulphate
2- Copper hydroxide
3- Copper Carbonate
4- Red mercuric oxide
5- Sodium nitrate

(7) How can you differentiate between each of the following:

1- Hydrogen and carbon dioxide gases. (by flame)
2- Copper sulphate solution and magnesium sulphate solution. (by zinc metal)
3- Zinc sulphate solution and copper sulphate solution (by iron filings)

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(8) Mention the name of the gas in each of the following:

1) Turns lime water milky.
2) Is obtained by the reaction between dilute hydrochloric acid and magnesium metal.
3) Increase the glowing of lighted splint.
4) Is produced from the thermal decomposition of sodium nitrate.

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Unit (2)

(1) Complete:

1- The current intensity due to the flow of 2700 coulomb in 300 second through a cross-section of a conductor equals ……

2- In the electric circuits, the ammeter is connected in ……, while the voltmeter is connected in ……

3- Volt = $\frac{\text{joule}}{\text{.....} \times \text{second}}$

4- There are two types of electric current which are …… and ……

5- The …… electric current can be transported only to short distance.

6- There are two methods of connecting electric cells which are …… and ……

7- ……, …… and cesium are natural radioactive elements.

8- Nuclear energy is used in medicine in …… and …… of some diseases.

(2) Write the scientific terms:

1- The flow of electric negative charges in a conducting material (metal wire). (……)

2- A device used to measure the electric current intensity. (……)

3- The work done to transfer unit of electric charge between two ends of a conductor. (……)

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4- The opposition to the flow of electric current in the conductor. (……)

5- The potential difference across the two poles of the battery when the circuit is opened. (……)

6- The electric current of constant intensity and direction. (……)

7- A type of connection of electric cells used to obtain high e.m.f. (……)

8- The process of conversion of atoms of some elements to reach more stability. (……)

9- The changes that take place to the living organism due to its exposure to radiations. (……)

(3) Choose the correct answer:

1- Electrons are …… charged particles.

a) positively b) neutral

c) negatively d) no correct answer

2- …… is the measuring unit of the electric charges.

a) coulomb b) Ampere

c) volt d) no correct answer

3- …… is used to measure the e.m.f of a battery.

a) Voltmeter b) Ammeter c) Rheostat d) ohmmeter

4- …… is the measuring unit of electric resistance.

a) ohm b) ampere c) volt d) coulomb

5- As the length of rheostat wire increases, the current intensity ……

a) increases b) decreases

c) constant d) there is no answer

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6- Direct current can be produced from ……

a) electrochemical cells b) electric generators

c) electric power stations d) electric motors

7- In the simple cell the …… energy is converted into electric energy.

a) kinetic b) magnetic c) chemical d) mechanical

8- In dynamo, …… energy is converted into electric energy.

a) magnetic b) kinetic c) chemical d) light

9- Alternating current is used in ……

a) electrolysis b) lighting house

c) electroplating d) both a & c

10- Radioactive phenomenon was discovered by the scientist ……

a) ohm b) Becquerel c) Ampere d) volt

11- Rockets use …… fuel for flying

a) gasoline b) kerosene c) natural gas d) nuclear

12- The measuring unit of the absorbed radiation is the ……

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1- The voltmeter is connected across the two poles of a battery.

2- Rheostat is used in some electric circuits.

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4- It is better to use alternating current rather than direct current.

5- Some cells are connected in the electric circuit in parallel.

6- The nuclei of radioactive elements are unstable.

7- Radioactivity has natural sources and also artificial.

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Model Answer

(1) Complete the following:

1- Metal oxide – sulphur trioxide

2- descending – chemical activity

3- broken – products

4- complementary

5- oxidizing agent

6- CO_2 – Mg

(2) Choose the correct answers:

1) CO_2

2) electrolysis

3) black colour

4) copper

5) loses oxygen

6) reduction

7) chlorine

(3) Put (√) or (x):

1- (X)

2- (√)

3- (X)

4- (√)

(4) Write the scientific term:

1- Thermal decomposition

2- Chemical activity series

3- Simple substitution reaction

4- double substitution reaction

5- Neutralization reaction

6- catalyst

7- oxidation

8- oxidation and reduction

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9- Oxidizing agent

10- Reduction

(5) Give reason for:

1- Bec. magnesium oxide is formed (white powder) as a result of direct combination between magnesium and oxygen.

$$2Mg + O_2 \xrightarrow{\Delta} 2MgO$$

2- Bec. silver is less active than the hydrogen of the acid (Ag comes after H in the C.A.S.)

3- Bec. mercuric oxide decomposes by heat into (Hg) metal (silver colour) and oxygen.

$$2HgO \xrightarrow{\Delta} 2\,Hg + O_2\uparrow$$

4- Bec. the electrons lost by the reducing agent in the oxidation process are gained by the oxidizing agent in the reduction process.

(6) What is the effect of heat on the following?(by equation)

1- $CuSO_4 \xrightarrow{\Delta} CuO + SO_3\uparrow$

2- $Cu(OH)_2 \longrightarrow CuO + H_2O$

3- $CuCO_3 \xrightarrow{\Delta} CuO + CO_2$

4- $2HgO \xrightarrow{\Delta} Hg + O_2\uparrow$

5- $2NaNO_3 \xrightarrow{\Delta} 2NaNO_3 + O_2\uparrow$

(7) How can you differentiate between each of the following:

1- Hydrogen → purn with blue fire and pop sound

carbon dioxide gases → put off the fire

2- Copper sulphate → red p.p.t

magnesium sulphate → no reaction

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3- Zinc sulphate → no reaction

sulphate solution → red p.p.t

(8) Mention the name of the gas in each:

1- CO_2

2- H_2

3- O_2

4- O_2

Unit (2)

(1) Complete:

1- 13.5 Amp.

2- series, parallel

3- volt = $\frac{\text{joule}}{\text{coilomb} \times \text{second}}$

4- direct – alternating

5- direct

6- series – parallel

7- radium, uranium

8- treat & diagnose diseases

(2) Write the scientific terms:

1- electric current

2- Ammeter

3- potential difference

4- resistance

5- e.m.f

6- direct electric current

7- series connection

8- radioactivity

9- mutation

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