

Last Look

Second term

By: Mr. Mohamed Taha

1) Choose the correct answer:-

- 1-Direct current can be produced from:
(Electrochemical cells – electric generators – electric power stations)
- 2-..... is the measuring unit of the electric charges (coulomb – ampere – volt)
- 3- The hormone releases the needed energy from the food stuffs:
(Growth – estrogen – thyroxin)
- 4- The is used to measure the electromotive force of a battery.
(Voltmeter – Ammeter – Rheostat)
- 5- The sliding Rheostat is used to change and in the electric circuit.
(The current intensity and potential difference – the resistance and potential difference – current intensity and resistance).
- 6- The Ammeter is used to measure in the electric circuit.
(The potential difference – the current intensity – the resistance)
- 7- The unit of measuring the electric resistance is (Ampere – Volt – Ohm)
- 8- The unit of measuring the current intensity is (Ampere – Volt – Ohm)
- 9- The direct current is used in (Lighting – electric paint – operating refrigerators)
- 10- The compound is used in the dry electrode.
(Sodium chloride – ammonium chloride – magnesium chloride)
- 11-One of the properties of the alternating current is
(Has constant value – change direction – used in electric paint)
- 12- The radioactive phenomenon was discovered by the scientist.....
(Ohm – Becquerel – Ampere)
- 13- The effects of radiation is a result of changing the sex chromosomes of the cells. (Physical – genetic – cellular)
- 14- Human beings should not be exposed to radiation in amounts more than rem.
(5 - 8 - 10)
- 15- is a nonradioactive element (radium – uranium – iron)
- 16- The measuring unit of absorption radiation is (Curie – rem – roentgen)

- 17- The hormone releases the needed energy from the food stuffs (growth – estrogen – thyroxin)
- 18- The hormone responsible for producing secondary sexual male characteristics is the hormone. (Progesterone – testosterone – adrenalin)
- 19- On heating copper hydroxide we obtain : (Copper carbonate and water – copper oxide and water – copper and hydrogen – copper oxide and hydrogen)
- 20- In thermal decomposition reactions, the compound is decomposed into: (Its simple components – its primary elements – other compounds – all the previous)
- 21- The hormone which stimulates the storage of glucose sugar in liver is the: (Insulin – estrogen – thyroxin – parathormone)
- 22- The two factors of the hereditary trait are similar in the individual: (Pure – hybrid – recessive – Pure and recessive)

2) Mendel placed a group of assumptions 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.

3) Writ the scientific term :

- 1- The flow of electric charges in a conductor.
- 2- The electric current of fixed intensity and direction.
- 3- Parts of the DNA that are present on the chromosomes and carry the hereditary traits of the individual.
- 4- Change in the nature of the hereditary factors that control the traits of the living organism, which results in a change in the traits of this living organism.
- 5- Mechanism with which hormone works inside the human body.
- 6- The breaking up of the molecules of the reactants and the forming of new coherences.
- 7- A chemical process where the atom gains one or more electron.
- 8- It is the substance which loses an electron or more during a chemical reaction.
- 9- A reaction where an element substitutes another one.
- 10- A solution that accepts the dissolution of an additional amount of the solute in it with the increase in temperature.
- 11- A solution whose components can be separated by refining or filtration.
- 12- A solution in which the solute molecules are distributed in the solvent irregularly.
- 13- A mixture that is homogenous in composition and properties and consists of two or more substances that are not chemically united.
- 14- A solution in which an additional amount of the solute can be added at a certain temperature
- 15- The obstruction the electric current during its flow in the conductor.
- 16- The flow of electric negative charges in a conducting element (metal wire).
- 17- The amount of electric charges that flow through a conductor in a certain time.
- 18- The process of spontaneous conversion of atoms of some elements present in nature to reach a more stability.

- 19- The radiation and nuclear energy emitted during nuclear reactions that can be controlled and carried out at nuclear reactors.
 - 20- The atoms of radioactive elements that contain the same number of protons and have different number of neutrons.
 - 21- The changes that take place to the living organism due to its exposure to radiations.
 - 22- The measuring unit of absorbed radiation.
 - 23- The flow of electric charges in a conductor.
 - 24- The electric current of fixed intensity and direction.
 - 25- The resistance of a conductor that allows the passing of an electric current of 1 Ampere through it when the potential difference between its two ends is 1 Volt.
 - 26- The intensity of the electric current flowing in an electric circuit when an electric charge of 1 Coulomb passes within the conductor's cross section in 1 second.
 - 27- The device used to measure the intensity of the electric current passing in a conductor.
 - 28- The electric state of a conductor that shows the transference of electricity from and to it.
 - 29- The measurement unit of the electromotive force of the electric cell.
 - 30- The measuring unit of the absorbed radiation.
 - 31- The natural conversion of the atoms of some elements in nature as an attempt to reach a more stable composition.
 - 32- A science that researches the transmission of the hereditary traits from one generation to another by the studying the similarity and difference between the parents and the offspring.
 - 33- The characters ready to be transmitted from one generation to another.
 - 34- The trait that appears in all individuals of the first generation in Mendel's experiments.
 - 35- The appearance of a hereditary trait in the individuals of the first generation when two individuals copulate and one of them is carrying a pure hereditary trait contrasting the trait carried by the other individual.
 - 36- It is chemically consisted of a nucleic acid called DNA connected with protein.
 - 37- They are parts of DNA on the chromosomes and control the hereditary traits of the individual.
 - 38- A disease caused by the increase of thyroxin hormone after the adulthood.
 - 39- The traits that are not transmitted from one generation to another.
 - 40- A gland that secretes a hormone that regulates the growth of the human sexual organs.
 - 41- A chemical message that controls and regulates the activities and functions of most of the body organs.
 - 42- Organs secreting hormones in the human body.
 - 43- Mechanism with which hormones work to achieve the homeostasis balance in the human body.
 - 44- The result when one of the endocrine glands does not work properly.
- 4) Write the balanced chemical equations for the following:**
- 1- The reaction between hydrochloric acid and sodium hydroxide.
 - 2- Adding silver nitrate solution to sodium chloride solution.
 - 3- The effect of heat on red mercury oxide.
 - 4- The reaction of zinc with diluted hydrochloric acid.
 - 5- The effect of heat on sodium nitrates.

- 5- If the potential difference between the terminals of a conductor is 6 volts, and the electric current of intensity 0.5 ampere is passed through it. Calculate the intensity of the electric current passing through this conductor if it is connected with a voltage source of 12 volts.
- 6- Calculate the quantity of electricity that pass through a conductor of resistance 1000 ohms for 30 minutes, given the potential difference between its two terminals is 220 volts.
- 7- Calculate the potential difference between two points if the work done to transfer a charge of 600 coulomb is 6600 joule.

9) Complete the following statements:

- 1- Oxidization is a chemical process where the atom an electron or more.
- 2- factor is the substance which gains one electron or more during a chemical reaction.
- 3- During reactions, the compound breaks up by heat into its simple components.
- 4- is the reaction between an acid and an alkali to form salt and water.
- 5- is the substance which gives oxygen and takes away hydrogen.
- 6- At the beginning of the reaction, the concentration of reactants is..... %
- 7- The change in the concentration of reactants and resultants in a time unit is.....
- 8- The increase in concentration of reactants makes the chemical reaction
- 9- The reaction of contributing compounds is
- 10- Sodium chloride powder reacts than a cube of sodium chloride.
- 11- A substance which increases the chemical reaction without sharing in the reaction is.....
- 12- $\text{NaCl} + \text{AgNO}_3 \longrightarrow \dots + \dots$
- 13- $\text{Cu}(\text{OH})_2 \longrightarrow \dots + \dots$
- 14- $2\text{NaNO}_3 \longrightarrow \dots + \dots$
- 15- $2\text{HgO} \longrightarrow \dots + \dots$
- 16- The size of the solute molecules in the real solution is than that in the colloidal solution.
- 17- In the solution, the solute molecules can be distinguished by the naked eye.
- 18- It is possible to dissolve more solute in the solution.
- 19- In the stomach, there is that help in the digestion of proteins
- 20- Solution can be classified in terms of homogeneity into and
- 21- The break up of existed bonds in the molecules of reactants and the forming of new bonds is called
- 22- The speed of chemical reactions due to the increase of temperature.
- 23- Dwarfism is a disease caused by the decrease of the secretion of hormone at the childhood.

- 24- Oxidation and reduction are two processes.
- 25- The components of the solution can be separated by refining or filtration.
- 26- The hormone is secreted when the rate of glucose sugar increases in the blood.
- 27- When the amount of glucose decreases in blood, pancreas secretes hormone
- 28- is measured by using the Voltmeter and has a measuring unit known as
- 29- The is used to measure the electromotive force of a battery in units known as
- 30- While connecting charged conductors, the electric current passes from the conductor have potential to the conductor have potential.
- 31- The electric current generated from a dynamo is due to converting energy to energy.
- 32- Cell produce current while the dynamo produces current.
- 33- There are two types of electric current, and
- 34- Hormones are directly secreted into the blood stream by
- 35- Thyroxin is a that regulates food assimilation in your body
- 36- When the secretion of the growth hormone decreases at the childhood, Man is infected by

10) Put a (✓) or (✗) in front of the following statements and correct the underline words:

- 1- The increase in the concentration of the reactants increases the number of collisions between molecules so that the speed of reaction decreases. ()
- 2- The dissolved particles of the colloidal solution can be seen by the naked eye. ()
- 3- Most metal carbonates decompose by heating into metal oxide and carbon dioxide. ()
- 4- The reactions of ionic compounds are slower than coordinate compounds. ()
- 5- Sulfuric acid is used in making car batteries. ()
- 6- You can convert the direct current to an alternating current. ()
- 7- Feedback is the mechanism with which hormones work in the human body. ()
- 8- The dynamo produces alternating electric current. ()
- 9- The genetic mutation occurs as a result of the change in the sequence of nitrogenous bases of the gene. ()
- 10- Genes are parts of DNA found in the cytoplasm of the cell. ()
- 11- Mutation in the somatic cells is transmitted to offspring. ()
- 12- The glucagon is secreted by pituitary gland. ()
- 13- Thyroid secretes a hormone that organizes the growth and development of sexual organs in the human body. ()

11) Mention three ways of protection from radioactive pollution?

12) Give reasons :

- 1- It is better to use the alternating current rather than the direct current.
- 2- The voltmeter is connected to both poles of the battery in the electric circuit
- 3- The fridge is used to preserve food.
- 4- Using molecule nickel in hydrating oil instead of pieces of nickel.
- 5- Reactions between ionic compounds are fast whereas reactions between contributing compounds are slow.
- 6- Mendel removed the stamens from the flowers of the plants.
- 7- Some mutations don't be transmitted from one generation to another.
- 8-The areas chosen for storing radioactive wastes should be stable.
- 9- Radiation has genetic effects.
- 10- After the Chernobyl accident, radioactive isotopes were found in the food products.
- 11- Magnesium can replace copper in its salt solutions, while opposite cannot happen.
- 12- Some elements are called radioactive elements.
- 13- The height of some persons may reach 3 meters.
- 14- The two adrenal glands have an important role when Man is exposed to emergency.
- 15- Pancreas is a double-function gland.
- 16- Mendel selected the pea plant to conduct his experiments.
- 17- Copper does not react with diluted hydrochloric acid.
- 18- Learn to walk in children is not considered a genetic trait.
- 19- Pituitary is called the "master gland".

13) Write one economical importance for each of the following:

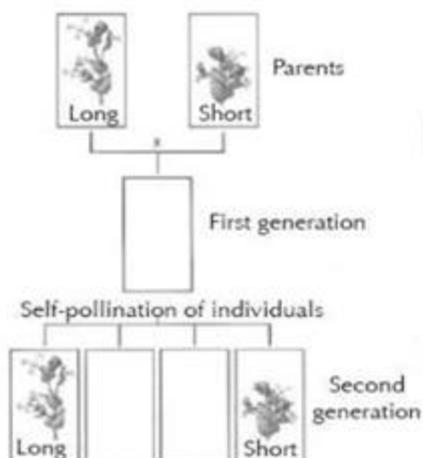
- 1- Sulfuric acid.
- 2- Calcium hydroxide.
- 3- Calcium carbonates.
- 4- Magnesium hydroxide.
- 5- Sodium chloride.
- 6 Hydrochloric acid.
- 7- Enzymes in the human body.

14) Explain the following:

- 1- The occurrence of effervescence on putting a piece of aluminum in diluted hydrochloric acid.
- 2- The rate of the reaction of hydrochloric acid with iron
- 3- Preservation of food in the freezer.
- 4- Mendel's selecting the pea plant to conduct his experiments.
- 5- When a pure yellow pod pea plant is pollinated with a pure green pod pea plant, it produces plants that are all with green pods.
- 6- The ability of bending the tongue is a dominant trait in the human being
- 7- An experiment to explain the law of independent assortment of the hereditary factors.
- 8- The model of Watson and Creek of the DNA structure
- 9- How the genes perform their functions.
- 10-When you pollinate a pure long stem pea plant with a short stem pea plant, it produces plants all are long stems.
- 11- The separate ear lobe is dominant over the adhered ear lobe.

15) The figure in front of you illustrates the mixed pollination between the flowers of the short pea plant and another long, determine:

- A- The individuals of the first generation.
 B- Complete the missing individuals of the second generation and describe the individuals of the second generation.
 C- Use symbols while expressing in the previous experiment.



16) Illustrate by experiment each of the following:

- 1- The importance of a catalyst in a chemical reaction.
- 2- The effect of the surface area on the speed of a chemical reaction.
- 3- The effect of temperature on the speed of a chemical reaction.
- 4- Determination the value of an unknown resistance or verifying of Ohm's law practically

Wishing you all good luck

Mr. Mohamed

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Ansewr sheets

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2-..... is the measuring unit of the electric charges (**coulomb** – ampere – volt)

3- The hormone releases the needed energy from the food stuffs:

(Growth – estrogen – **thyroxin**)

4- The is used to measure the electromotive force of a battery.

(**Voltmeter** – Ammeter – Rheostat)

5- The sliding Rheostat is used to change and in the electric circuit.

(**The current intensity and potential difference** – the resistance and potential difference – current intensity and resistance).

6- The Ammeter is used to measure in the electric circuit.

(The potential difference – **the current intensity** – the resistance)

7- The unit of measuring the electric resistance is (Ampere – Volt – **Ohm**)

8- The unit of measuring the current intensity is (**Ampere** – Volt – Ohm)

9- The direct current is used in (Lighting – **electric paint** – operating refrigerators)

10- The compound is used in the dry electrode.

(Sodium chloride – **ammonium chloride** – magnesium chloride)

11-One of the properties of the alternating current is

(Has constant value – **change direction** – used in electric paint)

12- The radioactive phenomenon was discovered by the scientist.....

(Ohm – **Becquerel** – Ampere)

13- The effects of radiation is a result of changing the sex chromosomes of the cells. (Physical – **genetic**– cellular)

14- Human beings should not be exposed to radiation in amounts more than rem.

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15- is a nonradioactive element (radium – uranium – **iron**)

16-.The measuring unit of absorption radiation is (Curie – **rem** – roentgen)

- 17- The hormone releases the needed energy from the food stuffs (growth – estrogen – **thyroxin**)
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- 19- On heating copper hydroxide we obtain : (Copper carbonate and water – **copper oxide and water** – copper and hydrogen – copper oxide and hydrogen)
- 20- In thermal decomposition reactions, the compound is decomposed into: (Its simple components – its primary elements – other compounds – **all the previous**)
- 21- The hormone which stimulates the storage of glucose sugar in liver is the: (**Insulin** – estrogen – thyroxin – parathormone)
- 22- The two factors of the hereditary trait are similar in the individual: (Pure – hybrid – recessive – **Pure and recessive**)

2) Mendel placed a group of assumptions 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.

The assumptions are:

- 1- The hereditary traits depend on the transmitted hereditary factors (genes) from the parents to their offsprings
- 2- Each hereditary factor is controlled by two factors.
- 3- The factors are separated (by meiosis division) in which each parent carries only one factor.
- 4- The two factors are copulated at fertilization to produce either hybrid or pure individual.

3) Writ the scientific term :

- 1- The flow of electric charges in a conductor. **Electric current**
- 2- The electric current of fixed intensity and direction. **Direct current**
- 3- Parts of the DNA that are present on the chromosomes and carry the hereditary traits of the individual. **Genes**
- 4- Change in the nature of the hereditary factors that control the traits of the living organism, which results in a change in the traits of this living organism. **Mutation**
- 5- Mechanism with which hormone works inside the human body. **Feedback mechanism**
- 6- The breaking up of the molecules of the reactants and the forming of new coherences. **Chemical reaction**
- 7- A chemical process where the atom gains one or more electron. **Reduction**
- 8- It is the substance which loses an electron or more during a chemical reaction. **Reducing factor**
- 9- A reaction where an element substitutes another one. **Simple substitution reaction**
- 10- A solution that accepts the dissolution of an additional amount of the solute in it with the increase in temperature. **Super saturated solution (pre saturated solution)**
- 11- A solution whose components can be separated by refining or filtration. **Suspension**

12- A solution in which the solute molecules are distributed in the solvent irregularly.

Non homogenous solution

13- A mixture that is homogenous in composition and properties and consists of two or more substances that are not chemically united. **Solution**

14- A solution in which an additional amount of the solute can be added at a certain temperature. **Saturated solution**

15- The obstruction the electric current during its flow in the conductor. **Resistance**

16- The flow of electric negative charges in a conducting element. **Electric current**

17- The amount of electric charges that flow through a conductor in a certain time.

Electric current intensity

18- The process of spontaneous conversion of atoms of some elements present in nature to reach a more stability. **Natural radioactivity**

19- The radiation and nuclear energy emitted during nuclear reactions that can be controlled and carried out at nuclear reactors. **Artificial radioactivity**

20- The atoms of radioactive elements that contain the same number of protons and have different number of neutrons. **Isotopes**

21- The changes that take place to the living organism due to its exposure to radiations.

Spontaneous mutation

22- The measuring unit of absorbed radiation. **Rem**

23- The flow of electric charges in a conductor. **Electric current**

24- The electric current of fixed intensity and direction. **Direct current**

25- The resistance of a conductor that allows the passing of an electric current of 1 Ampere through it when the potential difference between its two ends is 1 Volt. **Ohm**

26- The intensity of the electric current flowing in an electric circuit when an electric charge of 1 Coulomb passes within the conductor's cross section in 1 second. **Ampere**

27- The device used to measure the intensity of the electric current passing in a conductor.

Ammeter

28- The electric state of a conductor that shows the transference of electricity from and to it.

Electric potential of a conductor

29- The measurement unit of the electromotive force of the electric cell. Volt

30- The measuring unit of the absorbed radiation. **Rem**

31- The natural conversion of the atoms of some elements in nature as an attempt to reach a more stable composition. **Natural radioactivity**

32- A science that researches the transmission of the hereditary traits from one generation to another by the studying the similarity and difference between the parents and the offspring.

Genetics

33- The characters ready to be transmitted from one generation to another. Hereditary traits

34- The trait that appears in all individuals of the first generation in Mendel's experiments.

Dominant trait

35- The appearance of a hereditary trait in the individuals of the first generation when two individuals copulate and one of them is carrying a pure hereditary trait contrasting the trait carried by the other individual. **The principle of complete dominance**

36- It is chemically consisted of a nucleic acid called DNA connected with protein.

Chromosome

37-They are parts of DNA on the chromosomes and control the hereditary traits of the individual. **Genes**

38- A disease caused by the increase of thyroxin hormone after the adulthood.

Exophthalmic goiter

39- The traits that are not transmitted from one generation to another. Acquired traits

40- A gland that secretes a hormone that regulates the growth of the human sexual organs.

Pituitary gland

41- A chemical message that controls and regulates the activities and functions of most of the body organs. **Hormone**

42- Organs secreting hormones in the human body. **Endocrine glands**

43- Mechanism with which hormones work to achieve the homeostasis balance in the human body. **Feedback mechanism**

44- The result when one of the endocrine glands does not work properly. **Hormone disorder**

4) Write the balanced chemical equations for the following:

1- The reaction between hydrochloric acid and sodium hydroxide.



2- Adding silver nitrate solution to sodium chloride solution.



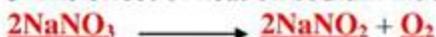
3- The effect of heat on red mercury oxide.



4- The reaction of zinc with diluted hydrochloric acid.



5-The effect of heat on sodium nitrates.



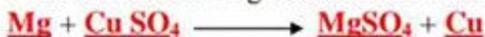
6- The reaction of water with sodium.



7- The reaction between hydrochloric acid and calcium hydroxide.



8- Insertion of a magnesium ribbon in a solution of copper sulphate.



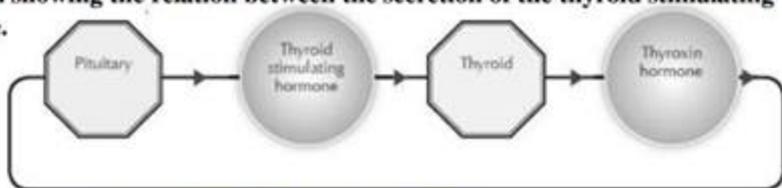
9- The reaction of Aluminium with diluted hydrochloric acid.



10- Reduction of hot copper oxide by hydrogen.



5) Draw a fully labeled diagram showing the relation between the secretion of the thyroid stimulating hormone and thyroxin hormone.



6) Compare between :

1- The spontaneous mutation and the induced mutation.

<u>Spontaneous mutation</u>	<u>Induced mutation</u>
-It is caused by environmental factors like: Exposure for (radiations – chemicals – high or low temperature) -It causes variation among the species of the living organisms.	-It is caused by man -It produces desirable traits like production of seedless, sweeter and larger fruits.

2- Heating of metal oxide and metal hydroxide.

<u>Heating of metal oxide</u>	<u>Heating of metal hydroxide</u>
-It produces metal and oxygen gas releases - Ex: $2\text{HgO} \longrightarrow 2\text{Hg} + \text{O}_2$	-It produces metal oxide and water -Ex: $\text{Cu}(\text{OH})_2 \longrightarrow \text{CuO} + \text{H}_2\text{O}$

3- Saturated and unsaturated solution.

<u>Saturated solution</u>	<u>Unsaturated solution</u>
-It is the solution in which an additional amount of the solute can be dissolved at a certain temperature	-It is the solution in which no additional amount of the solute can be dissolved without a change of the temperature

4- Oxidation and reduction.

<u>Oxidation</u>	<u>reduction</u>
-It is a chemical process in which the percentage of oxygen increases or the percentage of hydrogen decreases. -It is a chemical process in which the atom loses one electron or more.	-It is a chemical process in which the ratio of oxygen decreases or the ratio of hydrogen increases -It is a chemical process in which the atom gains one electron or more.

5- Connection in series and in parallel.

<u>Spontaneous mutation</u>	<u>Induced mutation</u>
-It is caused by environmental factors like: Exposure for (radiations – chemicals – high or low temperature) -It causes variation among the species of the living organisms.	-It is caused by man -It produces desirable traits like production of seedless, sweeter and larger fruits.

6- Colloidal and suspension solutions.

<u>Colloid</u>	<u>Suspension</u>
-It is a homogeneous solution in which its particles can be distinguished only by the microscope. -Ex: milk - blood.	-It is a non homogeneous solution in which its particles can be distinguished by the naked eye. -Ex: Chalk in water – sand in water.

7- Homogenous and non-homogenous solutions.

<u>Homogenous solution</u>	<u>non-homogenous solution</u>
-It is the solution in which its particles cannot be distinguished by the naked eye -Ex: Sugar in water – salt in water.	-It is the solution in which its particles can be distinguished by the naked eye -Ex: Sand in water – oil in water.

8- Simple substitution and double substitution reactions.

<u>Simple substitution</u>	<u>double substitution</u>
-It occurs when an active metal replaces a less active metal in its compound. -Ex: $Mg + CuSO_4 \rightarrow MgSO_4 + Cu$	- It occurs when two compounds in aqueous solution exchange ions & form two new compounds. -Ex: $HCl + NaOH \rightarrow NaCl + H_2O$

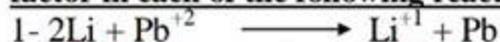
9- The dominant trait and the recessive one with giving examples.

<u>dominant trait</u>	<u>Recessive trait</u>
-It appears in the first generation by a ratio 100% and in the second one by a ratio 75% -It is pure or hybrid	-It does not appear in the first generation and appears in the second one by a ratio 25% -It is always pure.

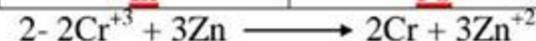
10- The inherited traits and the acquired traits

<u>inherited traits</u>	<u>acquired traits</u>
-They are the traits that are inherited from the parents to their offsprings through genes. -Like: Eye color – skin color – hair color	-They are the traits that are not inherited from the parents, but they are acquired from the surrounding environment -Like: Walking – writing – driving

7) Identify the process of oxidization, reduction, oxidizing factor and reducing factor in each of the following reactions:



<u>Oxidization</u>	<u>reduction</u>	<u>oxidizing factor</u>	<u>reducing factor</u>
<u>Li</u>	<u>Pb</u>	<u>Pb</u>	<u>Li</u>



<u>Oxidization</u>	<u>reduction</u>	<u>oxidizing factor</u>	<u>reducing factor</u>
<u>Zn</u>	<u>Cr</u>	<u>Cr</u>	<u>Zn</u>



<u>Oxidization</u>	<u>reduction</u>	<u>oxidizing factor</u>	<u>reducing factor</u>
<u>CH4</u>	<u>O2</u>	<u>O2</u>	<u>CH4</u>



<u>Oxidization</u>	<u>reduction</u>	<u>oxidizing factor</u>	<u>reducing factor</u>
<u>H2</u>	<u>CuO</u>	<u>CuO</u>	<u>H2</u>

8) Problems:

1- Calculate the potential difference of the two ends of a vacuum cleaner whose resistance is 22 Ohm and the current intensity passing through it is 10 Ampere.

$$V = R \times I \longrightarrow V = 22 \times 10 = 220 \text{ volt}$$

2- 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:

1) 1.5 volts (3 in parallel) 2) 3 volts (two in parallel + one in series)

3) 4.5 volts (3 in series)

3- You have 4 similar electric cells. The potential difference of each one is 1.5 Volt.

Illustrate by drawing how you connect them to get batteries of emf of:

A- 6 Volt. (4 in series) B- 4.5 Volt. (2 in series + 2 in parallel)

C- 3 Volt in two ways. (3 in parallel + one in series) or (2 in parallel + 2 in parallel)

D- 1.5 Volt. (4 in parallel)

4- You have four electric cells each of e.m.f 1.2 volt. Show by drawing the method of connecting them to obtain each of the following:

A) 1.2 volt (4 in parallel) B) 4.8 volt (4 in series)

c) 2.4 volt (2 in parallel + 2 in parallel)

5- If the potential difference between the terminals of a conductor is 6 volts, and the electric current of intensity 0.5 ampere is passed through it. Calculate the intensity of the electric current passing through this conductor if it is connected with a voltage source of 12 volts.

$$R = V/I \quad - \quad R = 6/0.5 = 12 \text{ ohm}$$

$$I = V/R \quad - \quad I = 12/12 = 1 \text{ Volt}$$

6- Calculate the quantity of electricity that pass through a conductor of resistance 1000 ohms for 30 minutes, given the potential difference between its two terminals is 220 volts.

$$I = V/R \quad - \quad I = 220/1000 = 0.22 \text{ Ampere}$$

$$I = Q/t \quad - \quad q = I \times t = 0.22 \times (30 \times 60) = 0.22 \times 1800 = 396 \text{ Coulomb}$$

7- Calculate the potential difference between two points if the work done to transfer a charge of 600 coulomb is 6600 joule.

$$V = W/q \quad - \quad V = 6600/600 = 11 \text{ volt}$$

9) Complete the following statements:

1- Oxidization is a chemical process where the atom loses an electron or more.

2- Oxidizing factor is the substance which gains one electron or more during a chemical reaction.

3- During thermal decomposition reactions, the compound breaks up by heat into its simple components.

- 4- **Neutralization** is the reaction between an acid and an alkali to form salt and water.
- 5- **Oxidizing agent** is the substance which gives oxygen and takes away hydrogen.
- 6- At the beginning of the reaction, the concentration of reactants is **100 %**.
- 7- The change in the concentration of reactants and resultants in a time unit is **the speed of chemical reaction**.
- 8- The increase in concentration of reactants makes the chemical reaction **faster**.
- 9- The reaction of contributing compounds is **slow**.
- 10- Sodium chloride powder reacts **faster** than a cube of sodium chloride.
- 11- A substance which increases the chemical reaction without sharing in the reaction is **catalyst**.
- 12- $\text{NaCl} + \text{AgNO}_3 \longrightarrow \text{NaNO}_3 + \text{AgCl}$
- 13- $\text{Cu}(\text{OH})_2 \longrightarrow \text{CuO} + \text{H}_2\text{O}$
- 14- $2\text{NaNO}_3 \longrightarrow 2\text{NaNO}_2 + \text{O}_2$
- 15- $2\text{HgO} \longrightarrow 2\text{Hg} + \text{O}_2$
- 16- The size of the solute molecules in the real solution is **smaller** than that in the colloidal solution.
- 17- In the **suspension** solution, the solute molecules can be distinguished by the naked eye.
- 18- It is possible to dissolve more solute in the **pre saturated** solution.
- 19- In the stomach, there is **hydrochloric acid** that helps in the digestion of proteins.
- 20- Solution can be classified in terms of homogeneity into **homogeneous** and **non homogeneous**.
- 21- The break up of existed bonds in the molecules of reactants and the forming of new bonds is called **chemical reaction**.
- 22- The speed of chemical reactions **increases** due to the increase of temperature.
- 23- Dwarfism is a disease caused by the decrease of the secretion of **growth** hormone at the childhood.
- 24- Oxidation and reduction are two **concurrent** processes.
- 25- The components of the **suspension** solution can be separated by refining or filtration.
- 26- The **insulin** hormone is secreted when the rate of glucose sugar increases in the blood.
- 27- When the amount of glucose decreases in blood, pancreas secretes **glucagon** hormone.
- 28- **Potential difference** is measured by using the Voltmeter and has a measuring unit known as **volt**.
- 29- The **Voltmeter** is used to measure the electromotive force of a battery in units known as **volt**.
- 30- While connecting charged conductors, the electric current passes from the conductor have **higher** potential to the conductor have **lower** potential.
- 31- The electric current generated from a dynamo is due to converting **mechanical** energy to **electric** energy.
- 32- Cell produces **direct** current while the dynamo produces **alternating** current.
- 33- There are two types of electric current, **direct** and **alternating**.
- 34- Hormones are directly secreted into the blood stream by **endocrine glands**.
- 35- Thyroxin is a **hormone** that regulates food assimilation in your body.
- 36- When the secretion of the growth hormone decreases at the childhood, Man is infected by **dwarfism**.

10) Put a (✓) or (✗) in front of the following statements and correct the underline words:

- 1-The increase in the concentration of the reactants increases the number of collisions between molecules so that the speed of reaction (increases). (✗)
- 2- The dissolved particles of the colloidal solution can be seen by microscope. (✗)
- 3- Most metal carbonates decompose by heating into metal oxide and carbon dioxide. (✓)
- 4- The reactions of ionic compounds are faster than coordinate compounds. (✗)
- 5- Sulfuric acid is used in making car batteries. (✓)
- 6- You can convert the alternating current to an direct current. (✗)
- 7- 16- Feedback is the mechanism with which hormones work in the human body. (✓)
- 8-The dynamo produces alternating electric current. (✓)
- 9-The genetic mutation occurs as a result of the change in the sequence of nitrogenous bases of the gene. (✓)
- 10- Genes are parts of DNA found in the nucleus of the cell. (✗)
- 11- Mutation in the reproductive cells is transmitted to offspring. (✗)
- 12- The glucagon is secreted by pancreas. (✗)
- 13- pituitary secretes a hormone that organizes the growth and development of sexual organs in the human body. (✗)

11) Mention three ways of protection from radioactive pollution?

1- Avoid exposure to radiation since, the maximum dose of radiation is 5 rem daily.

2- Wearing protective gloves, suits & masks by persons who handle radioactive elements in nuclear reactors & hospitals.

3- The nuclear wastes are surrounded by a cement or rocks and placed deeply inside the ground.

12) Give reasons :

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

Because alternating current can be used for short and long distances and it is suitable for operating the home appliances

2- The voltmeter is connected to both poles of the battery in the electric circuit

To measure the electromotive force

3- The fridge is used to preserve food.

Because it slows down the speed of chemical reaction in the food by cooling

4- Using molecule nickel in hydrating oil instead of pieces of nickel.

Because increasing the surface area of the reactants increases the speed of the reaction

5- Reactions between ionic compounds are fast whereas reactions between contributing compounds are slow.

Because ionic compounds break into ions, while covalent compounds do not.

6- Mendel removed the stamens from the flowers of the plants.

To prevent the plant from reproduction by self pollination

7- Some mutations don't be transmitted from one generation to another.

Because they are somatic mutations that occur in the body cells

8- The areas chosen for storing radioactive wastes should be stable.

To prevent the radioactive pollution to another areas

9- Radiation has genetic effects.

Because it causes changes in the sex chromosomes composition

10- After the Chernobyl accident, radioactive isotopes were found in the food products.

Because after moving the polluted atomic cloud, the rain fell caused a transference of the radioactive isotopes to the soil then to the plant and animals

11- Magnesium can replace copper in its salt solutions, while opposite cannot happen.

Because magnesium is more active than copper in the chemical activity series

12- Some elements are called radioactive elements.

Because they radiate unseen radiations spontaneously

13- The height of some persons may reach 3 meters.

Due to the increase of the growth hormone secreted by the pituitary gland during childhood

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

Because they stimulate the body organs against emergencies

15- Pancreas is a double-function gland.

Because it secretes two hormones which are insulin and glucagon where:

Insulin decreases the level of sugar in blood, while glucagon increases the level of the sugar in blood.

16- Mendel selected the pea plant to conduct his experiments.

Because pea plant:

1- is easy to be planted and it grows fast

2- Has short life cycle and it produces large crops

3- is easily pollinated artificially

4- Has hermaphrodite flowers, so it can be self pollinated

5- Has several pairs of contrasted traits

17- Copper does not react with diluted hydrochloric acid.

Because copper is less active than hydrogen

18- Learn to walk in children is not considered a genetic trait.

Because it is an acquired trait that is not inherited through generations

19- Pituitary is called the "master gland".

Because it secretes hormones which regulate the functions of the endocrine glands

Ansewr by your self the rest of questions

Wishing you all good luck

Mr. Mohamed