Gazette's Educational Supplement

Science 3rd Prep.

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I- Choose :-

1) ……metal doesn't replace the hydrogen of the diluted acids. (Magnesium – copper – zinc – iron)
2) Oxidation and reduction are ……processes. (Concurrent – separated – no correct answer)
3) There is ……force between the components of the nucleus (Repulsion- attraction- both are correct)
4) The French scientist …… is the discoverer of the radioactivity phenomenon. (Mendel – Ohm – Becquerel)
5) 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)
6) 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)
7) It is necessary not to be exposed to a radiation more than …… milli sivert per year for the workers in nuclear reactor. (20 – 10 – 5 - 1)
8) The area chosen for the storing of the radioactive wastes should be …… (Stable – away from the volcanoes – both are correct)
9) The scientist who made the model of the DNA molecule is … (Crick–pedal – Mendel)
10) Genes are found in the ..... of cell. (Cytoplasm – mitochondria – nucleus)
11) The two scientists …… and …… were able to explain the process of inheritance of the heredity traits. (Badel and Tatum – Watson and creek – Chamberlin and Molten)
12) Direct current can be produced form: (Electrochemical cells – electric generators – electric power stations)
13) …… is the measuring unit of the electric charges (coulomb – ampere – volt)
14) The ..... is used to measure the electromotive force of a battery. (Voltmeter – Ammeter – Rheostat)
15) 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).
16) The Ammeter is used to measure ..... in the electric circuit. (The potential difference – the current intensity – the resistance)
17) The unit of measuring the electric resistance is ..... (Ampere – Volt – Ohm)
18) The unit of measuring the current intensity is ..... (Ampere – Volt – Ohm)
19) The direct current is used in ..... (Lighting – electroplating – operating refrigerators)
20) The ..... element is used in the catalytic converter. (Sodium – palladium – magnesium)
21) One of the properties of the alternating current is.... (Has constant value – change direction – used in electric paint)
22) The radioactivity phenomenon was discovered by the scientist..... (Ohm – Becquerel – Ampere)
23) The ..... effect of radiation is a result of changing the sex chromosomes of the cells. (Physical – genetic– cellular)
24) ..... is a nonradioactive element (radium – uranium – iron)
25) The measuring unit of absorbed radiation is ..... (Curie – Sievert – roentgen)
26) On heating copper hydroxide we obtain : (Copper carbonate and water – copper oxide and water – copper and hydrogen – copper oxide and hydrogen)
27) In thermal decomposition reactions, the compound is decomposed into (Its simple components – its primary elements – other compounds – all the previous)
28) The two factors of the hereditary trait are similar in the …… individual: (Pure – hybrid – recessive – Pure and recessive)

1	copper	8	Both are correct	15	Current intensity and potential difference	22	Becquerel
2	Concurrent	9	Crick	16	Current intensity	23	Genetic
3	(both are correct)	10	nucleus	17	Ohm	24	Iron
4	Becquerel	11	Badel and Tatum	18	Ampere	25	sievert
5	Large and short	12	Electrochemical cells	19	Electroplating	26	Copper oxide &water
6	changing in the hemoglobin structure	13	coulomb	20	Palladium	27	Simple component
7	20	14	Voltmeter	21	Change direction	28	Pure and recessive

II- Write scientific term

1) The breaking up of the molecules of the reactants and the forming of new coherences……
2) It is the substance which loses an electron or more during a chemical reaction……
3) A reaction where an element substitutes another one.
4) Chemical reactions in which the compound breaks up into simple elements by heat……
5) The change in the concentration of reactants and resultants in the time unit……
6) A substance that increases the speed of the chemical reaction without Interfering in it or being consumed.
7) A chemical process in which an atom of the element acquires one or more electron……
8) The flow of electric charges in a conductor……
9) The electric current of constant intensity and direction
10) The obstruction the electric current during its flow in the conductor……
11) The amount of electric charges that flow through a conductor in a certain time……
12) The state of the conductor that show the transfer of electricity from and to it……
13) The process of spontaneous conversion of atoms of some elements present in nature to reach a more stability……
14) The radiation and nuclear energy emitted during nuclear reactions that can be controlled and carried out at nuclear reactors……
15) The atoms of radioactive elements that contain the same number of protons and have different number of neutrons……
16) The changes that appear on the living organism due to its exposure to radiations……
17) The electric current of variable intensity and direction.
18) 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.
19) 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.
20) The device used to measure the intensity of the electric current passing in a conductor.
21) The measurement unit of the electromotive force of the electric cell.
22) The measuring unit of the absorbed radiation.
23) 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.
24) The characters ready to be transmitted from one generation to another.
25) The trait that appears in all individuals of the first generation in Mendel's experiments.
26) 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.
27) It is chemically consisted of a nucleic acid called DNA connected with protein.
28) Parts of the DNA that are present on the chromosomes and carry the hereditary traits of the individual.

1	Chemical reaction	8	Electric current	15	Isotopes	22	sievert
2	Reducing agent	9	Direct current	16	Physical effect	23	Genetics
3	Simple substitution	10	Electric resistance	17	Alternating current	24	Inherited
4	Thermal decomposition	11	Current intensity	18	Ohm	25	Dominant
5	Speed of chemical reaction	12	Electric potential	19	Ampere	26	Principle of complete dominance
6	Catalyst	13	Natural radioactivity	20	Ammeter	27	Chromosome
7	Reduction	14	Artificial radioactivity	21	Volt	28	Gene

III- Put a (✔) or (✘) in front of the following statements and correct the underlined words:

a- The increase in the concentration of the reactants increases the number of collisions between molecules so that the speed of reaction decreases .( )
b- Most metal carbonates decompose on being heated into metal and carbon dioxide. ( )
c- The reactions of ionic compounds are slower than coordinate compounds. ( )
d- You can convert the direct current to an alternating current. ( )
e- The dynamo produces alternating electric current. ( )
f- Genes are parts of DNA found in the cytoplasm of the cell. ( )
g- When the level of sugar increase glucagon hormone is secreted ( )

a	X - increase
b	X- Metal oxide
c	X - faster
D	X - alternative-direct
E	√
F	X- nucleus
G	X - insulin

IV- Compare in table between each of the following

1- Alternating and direct currents. (source)
2- Connection in series and in parallel. (total e.m.f)
3- Heating of metal oxide and metal hydroxide. (products)
4- Oxidation and reduction. (definition)
5- Simple substitution and Double substitution (definition)
6- The dominant trait and the recessive one with giving examples. (definition)
7- The inherited traits and the acquired traits (definition)
8- Insulin and glucagon. (function)

	Direct current	Alternative current
direction	Constant	Variable
Intensity	Constant	Variable
produced from	electric cells(battery)	electric generator (dynamo)
Conversion	cannot be converted intoalternating current	can be converted into direct current
Transmission	-It cannot be transmitted longdistances	- It can be transmitted for long distances.
Uses	*Electroplating- toys –mobiles*	- lighting, homeappermate gelectric appliances

types	Series	parallel
way	Cells are connected one after one the positive of one with negative of another one	All positive poles of cells are collected in a pole andsame for the negative pole
Aim	To obtain high electromotive force	To obtain low electromotive force

oxidation	Reduction
Losing of electrons	Gaining of electrons
Positive charge increase	Positive charge decrease

	Metal oxide	Metal hydroxide
By heating	Metal +oxygen	Metal oxide + water

Simple substitution	Double substitution
A reaction where an element substitutes another one. $Mg + 2HC \longrightarrow MgCl_2 + H_2$	A reaction where an exchange of ions of compoundstake place $NaCl + AgNO_3 \longrightarrow NaNO_3 + AgCl$

Dominant	Recessive
Appears in all individuals of 1st generation	Disappear in 1st generation But appear in 2nd generation with ratio 25%
Curley hair - Free earlobe	Smooth hair - Attached ear lobe

Inherited trait	Acquired trait
Transfer from a generation to another	Does not transfer - Gained from the environment
Eye color – skin color	Playing sport – speaking languages

Insulin	glucagon
Secreted when level of sugar increase	Secreted when level of sugar decrease
Change glucose to glycogen	Change glycogen to glucose

V- Show by the chemical balanced equations the following:

1- Adding of hydrochloric acid to the sodium carbonate.
2- Adding of silver nitrate solution to the sodium chloride solution.
3- Passing of hydrogen gas on the hot black copper oxide.
4- The decomposition of sodium nitrates by heat.
5- The reaction of water with sodium.
6- Insertion of a magnesium ribbon in a solution of copper sulphate.
7- The reaction of hydrochloric acid with sodium hydroxide.
8- The effect of heat on red mercury oxide.
9- The reaction of zinc with diluted hydrochloric acid.
10- The reaction of Aluminum with diluted hydrochloric acid.

1	$Na_2CO_3 + 2HCl \rightarrow 2NaCl + CO_2 + H_2O$
2	$NaCl + AgNO_3 \rightarrow NaNO_3 + AgCl\downarrow$
3	$CuO + H_2 \rightarrow H_2O + Cu$
4	$2NaNO_3 \rightarrow 2NaNO_2 + O_2$
5	$2Na + H_2O \rightarrow 2NaOH + H_2$, heat
6	$Mg + CuSO_4 \rightarrow MgSO_4 + Cu$
7	$NaOH + HCl \rightarrow NaCl + H_2O$
8	$2HgO \xrightarrow{\Delta} 2Hg + O_2$
9	$Zn + 2HCl \rightarrow ZnCl_2 + H_2$
10	$2Al + 6HCl \rightarrow 2AlCl_3 + 3H_2\uparrow$

What would happen when?

1- The human is exposed to the radiation for large dose in short time
2- The gene does not produce its enzyme.
3- Mendel did not cover the stigma of pea plant during his experiment
4- A piece of sweet potatoes is added to a solution of hydrogen peroxide
5- Heating of sodium nitrate
6- The hormone of insulin is secreted
7- The iodine in food is decreased
8- When the rate of thyroxin increase in blood
9- The level of glucose sugar increases

1- Damage of digestive system, central nervous system, spleen and bone marrow
2- No chemical reaction happen ,no special protein and no trait appear
3- cross pollination
4- Increase the speed of chemical reaction due to presence of oxydase enzyme
5- Yellowish white sodium nitrite is produced and oxygen gas evolves
6- It changes glucose into glycogen stored in liver
7- Thyroxin decrease causing simple goiter
8- Exophthalmic goiter
9- Insulin is produced by pancreas to change sugar into glycogen stored in liver

Complete the following statements:

1) Sodium nitrate decomposes by heat into ……. …and ……
2) When sodium reacts with water…… gas evolves ,
3) The changing of the (Na) into (Na^+) is considered …… process ,
4) When the hydrogen gas passes on a hot copper oxide, copper oxide changes to be …… and …… is formed.
5) The reaction of salt solutions together is considered as …… reactions, which accompanied with the formation of ……
6) The metals are arranged in descending order according to their ……in the chemical activity series.
7) $2Na + 2H_2O \rightarrow$ …… …+ H_2 + ……
8) $2Al + 6HCl$ dil → ……. + ……
9) $Na_2CO_3 + 2HCl$ dil→ …… + ……. + …….
10) $2NaNO_3 \xrightarrow{\Delta}$ …… + ……
11) Oxidization is a chemical process where the atom …… an electron or more.
12) …… factor is the substance which gains one electron or more during a chemical reaction.
13) During …… reactions, the compound breaks up by heat into its simple components.
14) ……is the reaction between an acid and an alkali to form salt and water.
15) …… is the substance which gives oxygen and takes away hydrogen.
16) At the beginning of the reaction, the concentration of reactants is…… %
17) The change in the concentration of reactants and resultants in a time unit is……
18) The increase in concentration of reactants makes the chemical reaction ……
19) The reaction of contributing compounds is ……
20) Sodium chloride powder reacts …… than a cube of sodium chloride.
21) A substance which increases the speed of chemical reaction without sharing in the reaction is……
22) $NaCl + AgNO_3 \rightarrow$ …… + ……
23) $Cu(OH)_2 \xrightarrow{\Delta}$ …… + ……
24) $2NaNO_3 \xrightarrow{\Delta}$ …… + ……
25) $CuSO_4 \xrightarrow{\Delta}$ …… + ……
26) The speed of chemical reactions …… due to the increase of temperature.
27) …… and ……is measured by using the Voltmeter and has a measuring unit known as …….
28) While connecting charged conductors, the electric current passes from the conductor have …… potential to the conductor have …… potential.
29) The electric current generated from a dynamo is due to converting …… energy to …… energy.
30) Electric Cell produce …… current while the dynamo produces …… current.
31) There are two types of electric current, …… and ……
32) Ammeter is connected on ……in the circuit.
33) The transfer of electric charges from electric conductor to another depends on the …
34) The potential difference is measured by the …… apparatus and …… unit.
35) The work done to transfer electric charges is measured by …… unit.
36) The opposition that the current faces during its motion in the wires is called ……
37) The idea of operation of the electric rheostat depends on……
38) The value of the current intensity can be changed (controlled) by using …… apparatus.
39) There are two types of the traits in the livings …… and ……
40) The scientist …… has conducted the main principles of heredity.
41) The pea plant is …… , so it could be self pollinated.
42) The …… trait appears in the first generation only, while the …… appears in the second generation with a percentage 25 %.
43) The genetic factors of one trait are segregated during the formation of ……
44) in the second generation the dominant traits are inherited to the recessive one in the ratio …… : ……
45) ……is the work done when the potential difference of one volt and the quantity of charge = 1coloumb
46) The two scientists …… and …… were able to make a model for DNA molecule.
47) Hormones are directly secreted into the blood stream by ……
48) …… gland secretes …… hormone which controls the general growth of the body.
49) Thyroxin is a …… that regulates food assimilation in your body.

1	Sodium nitrite → oxygen	18	Faster	35	Joule
2	Hydrogen	19	Slow	36	Electric resistance
3	Oxidation	20	Faster	37	Change resistance by change length of wire
4	Copper → water vapour	21	Catalyst	38	Rheostat
5	Double substitution-precipitate	22	$NaNO_3 + AgCl$	39	Inherited –acquired
6	Chemical activity	23	$CaO + H_2O$	40	Mendel
7	NaOH - Heat	24	$NaNO_2 + O_2$	41	Biosynal
8	$2AlCl_3 \rightarrow 3H_2$	25	$CaO + SO_2$	42	dominant -recessive
9	$2NaCl + H_2O + CO_2$	26	Increase	43	Gametes
10	$2NaNO_3 \rightarrow O_2$	27	Potential difference - electromotive force - volt	44	3 :1
11	Lose	28	higher - lower	45	Joule
12	Oxidizing	29	Kinetic –electric	46	Watson-Crick
13	Thermal decomposition	30	Direct –alternating	47	Ductless glands
14	Neutralization	31	Direct –alternating	48	Pituitary –growth
15	Oxidizing agent	32	Series	49	hormone
16	100	33	Electric potential		
17	speed of chemical reaction	34	Voltmeter –volt		

VI- 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.
……

2- 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
……

3- 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.
……

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

1	$V = I \times R = 10 \times 22 = 220$ volt
2	$R = \frac{V}{I} = \frac{6}{0.5} = 12$ Ohm $\quad I = \frac{V}{R} = \frac{12}{12} = 1$ ampere
3	$I = \frac{V}{t} = \frac{220}{1000} = 0.22$ ampere $\quad t = 30 \times 60 = 1800$ sec $Q = I \times t = 0.22 \times 2 \times 1800 = 396$ coulomb
4	$V = \frac{W}{Q} = \frac{6600}{600} = 110$ volt

1	Quantity of charges passing through a conductor in one second
2	It's the state of the electric conductor which determines the direction of electric current
3	The work done to transfer quantity of charges between two ends of a conductor
4	Quantity of electric charges when the current intensity =1 ampere, and time = one second
5	It's the potential difference when a work done of 1 joule transfer a quantity of charge of 1 coulomb
6	The resistance of a conductor where the current intensity is one ampere & its potential difference is one volt.
7	The current intensity is directly proportional to the potential difference at constant temperature
8	When 2 individuals having a pure contrasting trait crossed only one trait appear in the 1st generation
9	When 2 individuals having a pure contrasting trait crossed only one trait appear in the 1st generation and in the2nd generation both traits appear by ratio 3:1
10	When 2 individuals having two or more contrasting trait crossed Each trait is inherited independently in the 2nd generation by ratio 3:1
11	are parts of chromosomes that carry hereditary traits from a generation to another

12	-The substance that take oxygen or give hydrogen- or the substance that lose electrons
13	The reaction between acid and alkali to form salt and water
14	Quantity of electric charges flowing through a cross. Section of the conductor in one second = 1.5 ampere
15	The work done to transfer a quantity of charge between two ends of a conductor
16	the ratio between the potential difference and current intensity = 5 Ohm
17	Chemical substances secreted by ductless directly to the blood
18	A disease caused due to decrease in insulin hormone
19	A disease caused due to decrease in growth hormone

VII- Define each of the following:

1. Current intensity is……
2. The electric potential is……
3. The potential difference is……
4. Coulomb is ……
5. Volt is……
6. Ohm is……
7. Ohm's law states that……
8. Principle of complete dominance……
9. The law of segregation states that……
10. The second law of Mendel states that……
11. Gene……
12. Reducing agent (two definitions)……
13. Neutralization……
14. The current intensity passes in the conductor 1.5 ampere…
15. The potential difference between two terminals of a conductor is 5 volts……
16. A resistance of a conductor = 5 Ohms……
17. Hormones……
18. Diabetes ……
19. Dwarfism……

VIII- VII- Give reason for:

1) A white precipitate is formed when silver nitrate solution is added to sodium chloride solution……
2) A black substance is formed by the heating of green copper carbonate……
3) Effervescence occurs when sodium carbonate is added to hydrochloric acid.
4) A reddish brown ppt. is formed by adding magnesium to the copper sulphate solution……
5) Metals are considered as reducing agents.
6) Chemical reactions are different in their speeds.
7) Reaction of sodium chloride is faster than oil.
8) The reaction hydrochloric acid with magnesium powder is faster than the reaction with a ribbon of magnesium……
9) The increase in the temperature increase in the speed of the chemical reaction……
10) The fridge is used to preserve food……
11) Alternating current is preferable in using than direct current……
12) Mendel selected the pea plant to conduct his experiments……
13) Mendel removed the stamens and covered the stigma from the flowers of the plants.
14) The absence of freckles considered as a dominant traits in the human……
15) The voltmeter is connected to both poles of the battery in the electric circuit……
16) Using molecule nickel in hydrating oil instead of pieces of nickel……
17) Reactions between ionic compounds are fast whereas reactions between contributing compounds are slow.
18) The areas chosen for storing radioactive wastes should be stable……
19) Radiation has genetic effects……
20) Magnesium can replace copper in its salt solutions, while opposite cannot happen……
21) Some elements are called radioactive elements.
22) Copper does not react with diluted hydrochloric acid.
23) Endocrine glands are called ductless.
24) Pituitary gland is called "the master gland".
25) Pancreas is a double function gland.
26) Human is infected with diabetes disease.

1	Due to formation of silver chloride	14	Bec it appears in all individuals of the first generation
2	Due to formation of black copper oxide	15	To determine the electromotive force
3	Due to formation of carbon dioxide	16	To increase the speed of chemical reaction by increasing surfacearea
4	Due to formation of copper metal	17	Because ionic compounds break into ionsBut covalent react as molecules
5	Because they lose electrons	18	To be away from volcanoes and earthquakes to not pollute the environment
6	Due to difference in type of bond, concentration and temperature	19	Bec it affect sex chromosomes causing abnormal birth
7	- Because sodium chloride is an ionic compound whichcan break into ions	20	Bec. Magnesium is more active than copper so cr copper followmagnesium in chemical activity series
8	Due to increase of surface area	21	Bec they have unstable nuclei bec the ratio between no. of neutronsand protons is high
9	Due to increase number of collisions	22	Because copper is less active than hydrogen
10	Due to increase of speed of chemical reaction does bybacteria	23	Bec they secrete hormones directly to the blood
11	Bec. Can be transferred for long distance and can beconverted to direct current	24	Bec it control and activate other glands
12	Bec. it has short life cycle, grow fast , bisexual andeasily pollinated	25	Bec. It secrete enzymes in duct gland to help in digestion also insecrete hormone directly to the blood to control sugar level in it
13	To prevent self and cross pollination	26	Due to decrease of secretion od insulin hormone by pancreas

Answer by your self

Show by drawing only:

1) You have four electric cells each of e.m.f 1.2 volt. Show by drawing the method of connecting them all to obtain each of the following:
A) 1.2 volt B) 4.8 volt
c) 2.4 volt

Answer the following:

1- Use the following symbols to conduct the results of the mating between the pea plant with long stem (TT) and another one with (tt).

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.
……

To remember

Ohm	Discover relation between potential difference and current intensity
Becquerel	Radioactivity
Mendel	genetics
Watson-Creek	Design D.N.A model
Badel-Tatum	How trait transfer

	Physical quantity	unit	Device used		Physical quantity	unit
1	Current intensity	Ampere	Ammeter	4	Quantity of charge	Coulomb
2	Potential difference	Volt	Voltmeter	5	work	Joule
3	Electromotive force	Volt	Voltmeter	6	Absorbed radiation	Sievert
4	Electric resistance	Ohm	Ohmmeter			

- If you have three similar cells each of e.m.f =1.5 volt, Find the total e.m.f for each diagram: