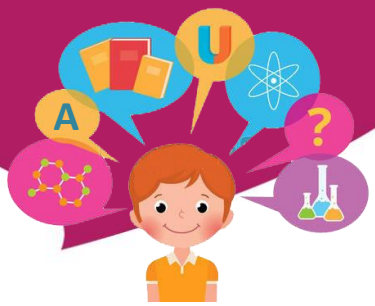


Questions

(1) Complete:

1) The most important attempts to classify elements are ……., ……. and …….

2) Mendeleev discovered that the properties of elements were repeated ……. by the beginning of each …….

3) In 1913, the Newzeland scientist ……. discovered that the nucleus of the atom contains …….

4) Moseley discovered after studying ……. rays, the periodic properties of elements are related to their ……. and not to their …….

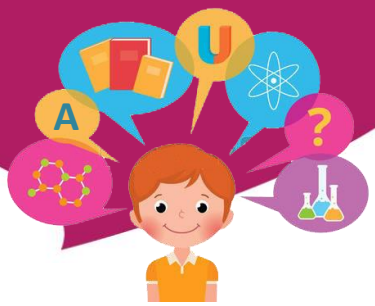
5) The modern periodic table consists of ……. horizontal periods and ……. vertical groups.

6) Groups of d-block take letter ……. except group ……. which consists of ……. vertical column.

7) In the modern periodic table, element of group ……. are located on the left, right side, while elements of group ……. are located in the middle of the table.

8) The number of electrons in the outer most energy level in the atom of an element indicates its ……. number.

9) Element $_{13}X$ lies in period ……. and group ……. in the modern periodic table.



10) By increasing the atomic number within a period, the atomic size ……. because the ……. between positive nucleus and outer most electrons increases.

11) The atomic size of Magnesium ($_{12}$Mg) atom is ……. than that of beryllium ($_{4}$Be) atom as the ……. of Magnesium atom is greater than that of beryllium atom.

12) ……. Is the ability of the atom in covalent molecule to attract the ……. of the bond towards itself.

13) By increasing the atomic size in the group, the electronegativity ……. and the atomic number …….

14) During the chemical reaction, metal atom tends to ……. electrons and changes into …….

15) During the chemical reaction, non-metal atom tends to ……. electrons and changes into …….

16) By increasing the atomic number within group (1), the metallic property ……., while by increasing the atomic number in group (17), the nonmetallic property is …….

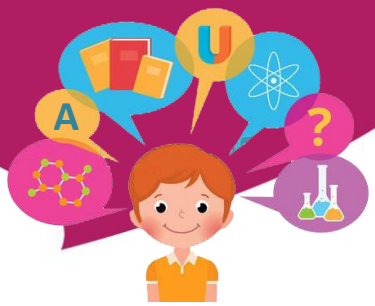
17) Metal oxides are called ……. oxides, while non-metal oxides are called ……. oxides.

18) Mg + ……. $\xrightarrow{dil}$ $MgCl_2$ + …….

19) $CO_2 + H_2O \rightarrow$ …….

20) $C + O_2 \xrightarrow{\Delta}$ …….

21) Elements of group (1) are named as ……. and they are from ……. block elements.



22) Elements of group (1) are called alkali metals as their elements react with ……. forming ……. solutions.

23) The valency of alkali metals is …….. as they have …….. electrons (s) in their outer most energy level.

24) …….. is the most active metal as it has the largest ……..

25) During the chemical reaction, alkaline earth metals tend to …….. electrons and convert into …….. ions which carry …….. positive (charges).

26) Water can dissolve some …….. compounds such as sugar as they can form …….. bonds with water.

27) Water has …….. effect on litmus paper as it gives equal numbers of positive …….. ions and negative …….. ions.

28) $2H_2O \xrightarrow{\text{.....}}$ ……. ↑ + ……..…↑

29) Artificial water pollutants are classified into …….. and ……..

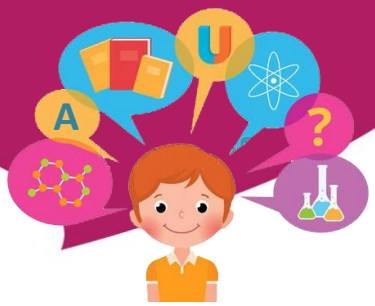
30) There are …….. bonds among the water molecules.

(2) Write the scientific term:

1- The first real periodic table for classifying elements.
(…….)

2- The partition of periodic table that contains elements having similar proportion in vertical column. (…….)

3- The table in which elements are arranged according to their atomic number. (…….)



4- A group of elements found of the periodic table and includes ten vertical columns. (…….)

5- Elements of d-block in the modern periodic table.

(…….)

6- Elements of group zero in the modern periodic table.

(…….)

7- The number of protons inside the nucleus of atom of an element.

(…….)

8- The measuring unit of atomic radius which is used as a measure for the atomic size. (…….)

9- The relationship between the atomic size of the atom of an element and its electronegativity. (…….)

10- An atom of metallic element which loses one electron or more during the chemical reaction. (…….)

11- The inert gas which has the same electronic structure of sodium ion (Na^+). (…….)

12- Oxides which dissolve in water producing alkali.

(…….)

13- The first group of s-block groups in the periodic table.

(…….)

14- The most active metal in the periodic table. (…….)

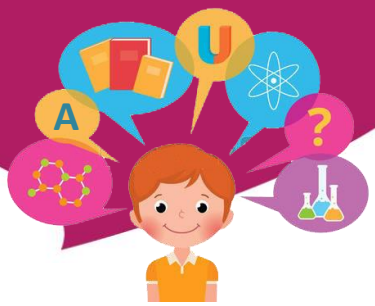
15- The second group at s-block groups in the periodic table.

(…….)

16- Monovalent elements exist in p-block in the periodic table.

(…….)

17- The halogen which exists in a solid state. (…….)



18- The halogen which exists in a liquid state. (…….)

19- The kind of rays which are emitted from cobalt (60).
(…….)

20- The metalloid which is used in the manufacture of electronic devices. (…….)

21- It is a series in which metals are arranged in a descending order according to their chemical activity. (…….)

22- They are non metallic oxides which dissolve in water forming acidic solutions. (…….)

23- It is a weak electrostatic attraction force that arises between the molecules of polar compounds. (…….)

24- It is the process of converting the molecules of some covalent compounds into ions. (…….)

25- It is addition of any substance to the water which causes continous gradual change in water proportion affecting the health and the life of living creatures. (…….)

(3) Give reason for:

1) Mendeleev left gaps (empty cells) in his periodic table.

……..

2) Mendeleev had to put more than one element in one cell.

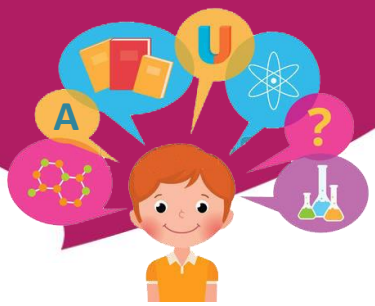
……..

3) Mendeleev classified the elements of each groups into two sub groups.

……..

4) Element of the same groups have similar properties.

……..



5) The atomic size decreases in periods by increasing the atomic number.

……..

6) The atomic size of ($_{11}$Na) is greater than that of ($_{3}$Li)

……..

7) Water molecule is from the polar molecules.

……..

8) During the chemical reactions, sodium ($_{11}$Na) atom tends to form positive ions.

……..

9) Cesium (Cs) is the most metallic element in group (1A)

……..

10) We can use dilute HCl to differentiate between copper and Magnesium.

……..

11) Alkali metals are monovalent elements, while alkaline earth metals are divalent ones.

……..

12) Lithium floats on water surface, while cesium sinks in water.

……..

13) Elements of group (2A) are not kept under the surface of kerosene.

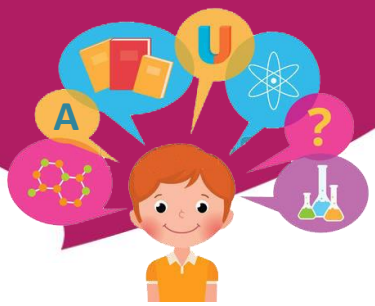
……..

14) Cobalt – 60 is used in preservation of food.

……..

15) Liquified Nitrogen is used in preservation of cornea of the eye.

……..



16) Dissolving of sugar in water although it is from covalent compounds.

……..

17) Pure water has no effect on litmus paper.

……..

18) Oxygen gas evolves at a node, while hydrogen gas evolves at cathode.

……..

19) Adding few drops of dilute sulphuric acid to water during its electrolysis by Hofmann's voltameter.

……..

20) We should not keep the tap water in plastic bottles.

……..

(4) Find the location of the next elements in the modern periodic table:

$_{19}K$ - $_{10}Ne$ - $_{3}Li$ - $_{13}Al$ - $_{11}Na$ - $_{2}He$

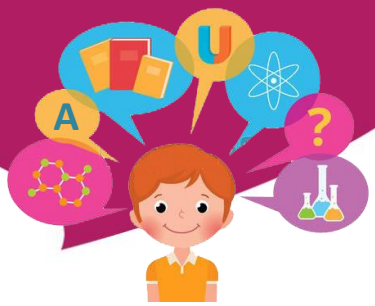
(5) Find the atomic number for elements in:

1- Period (4) group (2A)

2- Period (2) group (2A)

3- Period (3) group (zero)

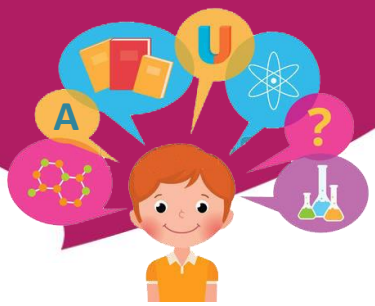
4- Period (2) group (7A)



Model Answer

(1) Complete:

1) Medeleeve, Moseley and Modern periodic table
2) periodically – period
3) Rutherford – protons
4) X rays – atomic number – atomic weight
5) 7 – 18
6) B – 8 – 3
7) A - B
8) group
9) 3 - 3A
10) decreases – attraction force
11) bigger – number of energy levels
12) electronegatively - electrons
13) decreases – increases
14) loses – positive ion
15) gains – negative ion
16) increases – decreases
17) basic oxides – acidic oxidic
18) 2 HCl – $H_2\uparrow$
19) H_2CO_3
20) $CO_2\uparrow$
21) Alkali metals – S



22) water – alkaline solution

23) Monovalent – one

24) Cesium – atomic size

25) loses two – positive – two

26) Covalent – hydrogen

27) neutral – hydrogen – hydroxide

28) $2H_2O \xrightarrow[\text{electrolysis}]{\text{Dil } H_2SO_4} 2H_2\uparrow + O_2\uparrow$

29) biological – chemical – thermal and radiant pollution

30) hydrogen

(2) Write the scientific term:

1- Mendeleev's periodic table

2- group

3- Moseley's periodic table

4- transition elements

5- transition elements

6- inert gases

7- atomic number

8- pico metre

9- inversely proportional

10- positive ion or cation

11- Neon

12- metal oxides

13- Alkali metal

14- Cesium

15- Alkaline earth metal

16- Halogens

17- Iodine

18- Bromine

19- Gamma

20- Silicon

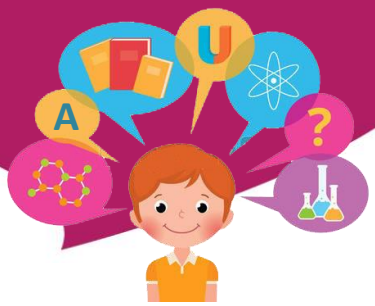
21- Chemical activity series

22- Acidic oxides

23- Hydrogen bond

24- Ionization

25- water pollution



(3) Give reason for:

1) Mendeleev left gaps (empty cells) in his periodic table.

Because he predicted the discovery of new elements.

2) Mendeleev had to put more than one element in one cell.

To put these elements according to similarity in their properties.

3) Mendeleev classified the elements of each groups into two sub groups.

Due to the differences between their properties.

4) Element of the same groups have similar properties.

Because their atoms have the same number of electrons in the outermost energy level.

5) The atomic size decreases in periods by increasing the atomic number.

Because the attraction force between the positive Nucleus and the outermost electrons increases through the period by increasing the atomic number.

6) The atomic size of ($_{11}$Na) is greater than that of ($_{3}$Li)

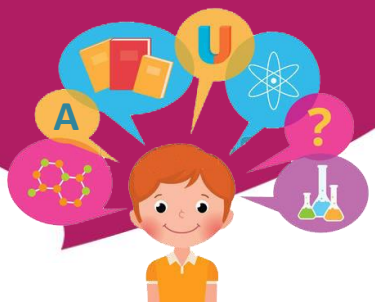
Due to the increase of the number of energy levels through the group by increasing the atomic number, Lithium has two energy levels but sodium has three energy levels.

7) Water molecule is from the polar molecules.

Because the difference in electronegativity between the elements forming their molecules is relatively high

H = 2, 1 O = 3.5

So the electronegativity between O & H = 3.5 - 2.1 = 1.4



8) During the chemical reactions, sodium ($_{11}Na$) atom tends to form positive ions.

Because sodium atom loses the outermost electron forming positive ion carrying one positive charge (Na^+)

9) Cesium (Cs) is the most metallic element in group (1A)

Because it has the largest atomic size in group 1A so it loses the outmost electron very easy.

10) We can use dilute HCl to differentiate between copper and Magnesium.

Because Magnesium reacts with dilute HCl and Hydrogen gas evolves, while copper doesn't react with HCl.

$$Mg + 2HCl \xrightarrow{dil} MgCl_2 + H_2\uparrow$$

11) Alkali metals are monovalent elements, while alkaline earth metals are divalent ones.

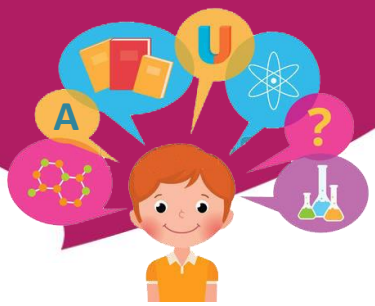
Because alkali metals have only one electron in their outermost energy level, but alkaline earth metals have two electrons in their outermost energy level.

12) Lithium floats on water surface, while cesium sinks in water.

Because the density of Lithium is less than that of water, while the density of cesium is greater than that of water.

13) Elements of group (2A) are not kept under the surface of kerosene.

Because they don't react with moist air as they less active than alkali metals.



14) Cobalt – 60 is used in preservation of food.

Because it emits gamma rays which prevent the reproduction of microbial cells.

15) Liquified Nitrogen is used in preservation of cornea of the eye.

Due to the decrease of its boiling point (-196^{o})

16) Dissolving of sugar in water although it is from covalent compounds.

Because sugar molecules can make hydrogen bond with water molecules.

17) Pure water has no effect on litmus paper.

Because when water ionizes, it gives equal numbers of positive hydrogen ions (H^{+}) and negative hydroxide ions (OH^{-}).

18) Oxygen gas evolves at anode, while hydrogen gas evolves at cathode.

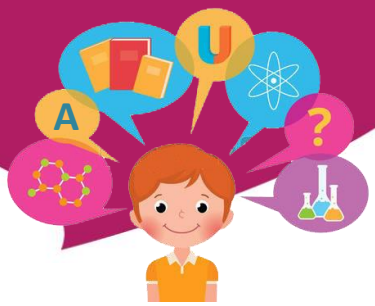
Oxygen gas evolves at the anode because its ions are negatively charged, while hydrogen gas evolves at the cathode because its ions are positively charged.

19) Adding few drops of dilute sulphuric acid to water during its electrolysis by Hofmann's voltameter.

Because pure water is a bad conductor of electricity, but acidified water good conductor of electricity.

20) We should not keep the tap water in plastic bottles.

Because plastic reacts with chlorine gas leading to the increase in the infection rates by cancer.



(4) Find the location of the next elements:

$_{19}K$ — 2, 8, 8, 1

Period 4

Group 1A

$_{10}Ne$ — 2, 8

Period 2

Group zero

$_{3}Li$ — 2, 1

Period 2

Group 1A

$_{13}Al$ — 2, 8, 3

Period 3

Group 3A

$_{11}Na$ — 2, 8, 1

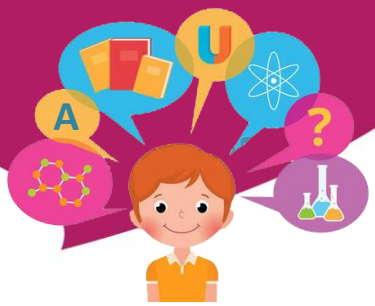
Period 3

Group 1A

$_{2}He$ — 2

Period 1

Group zero



(5) Find the atomic number for elements in:

1-)))) → 20
2 8 8 2

2-)) → 4
2 2

3-))) → 18
2 8 8

4-)) → 9
2 7