



Questions

Unit (1)

(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 block are
located on the left, right side, while elements of block
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 ${}_{13}\text{X}$ 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 ($_{12}\text{Mg}$) atom is than that of beryllium ($_{4}\text{Be}$) 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) $\text{Mg} + \dots \xrightarrow{\text{dil}} \text{MgCl}_2 + \dots$
- 19) $\text{CO}_2 + \text{H}_2\text{O} \rightarrow \dots$
- 20) $\text{C} + \text{O}_2 \xrightarrow{\Delta} \dots$
- 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 electron 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) $2\text{H}_2\text{O} \xrightarrow{\text{.....}} \text{.....} \uparrow + \text{.....} \uparrow$
- 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 continuous 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 ($_{11}\text{Na}$) is greater than that of ($_3\text{Li}$)

.....

7) Water molecule is from the polar molecules.

.....

8) During the chemical reactions, sodium ($_{11}\text{Na}$) 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.

.....

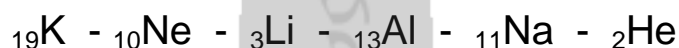
19) Adding few drops of dilute sulphuric acid to water during its electrolysis by Hofmann's voltmeter.

.....

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

.....

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



(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)



Unit (2)

(1) What is meant by:

- 1- Atmospheric envelope of the Earth
- 2- Atmospheric pressure
- 3- Isobar
- 4- Tropopause
- 5- Stratopause
- 6- Mesopause
- 7- Van Allen belts
- 8- Aurora phenomenon
- 9- Exosphere
- 10- Global warming phenomenon
- 11- Green house phenomenon

(2) Give reasons for:

- 1- The troposphere layer is called by this name.
- 2- The upper part of thermosphere layer is called ionosphere.
- 3- Mesosphere layer is highly rarefied.
- 4- Mesosphere layer is called by this name.
- 5- The stratosphere layer is called ozonic atmospheric envelope.
- 6- The last layer of atmospheric envelope is called thermal layer.



Unit (3)

(1) What is meant by:

- 1) Fossils
- 2) Traces
- 3) Remains
- 4) Amber
- 5) Solid cast
- 6) Mold
- 7) Petrified fossils
- 8) Petrified woods
- 9) Extinction
- 10) Natural protectorates
- 11) Complicated ecosystem
- 12) Simple ecosystem
- 13) Food chain
- 14) The moment of extinction

Give reasons for:

- 1- Removing trees of tropical forests is one of the most important factors of extinction.
- 2- Bald eagle is from endangered species.
- 3- The desert ecosystem is significantly affected by the absence of one its species.



- 4- UNESCO has chosen Wadi Hetan area as the best world heritage area for whales skeletons.
- 5- Bluestone is an important natural protectorate.
- 6- Scientists attempt to establish a gene bank for some types of living organisms.
- 7- Scarcity of bamboo plant.
- 8- Disappearance of papyrus plant in upper Nile.
- 9- Ammonites fossil is classified as a cast fossil.
- 10- Formation of petrified woods fossils.
- 11- Naming the petrified forest with wood mountain.
- 12- The petrified woods are considered from fossils although they look like rocks.
- 13- Gebel El-Mokattam was a part of a sea floor more than 35 million years ago.



Model Answer

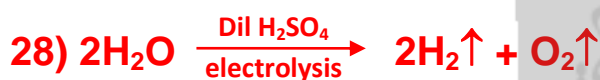
Unit (1)

(1) Complete:

- 1) Medeleev, 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) S - d
- 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) $2 \text{HCl} - \text{H}_2\uparrow$
- 19) H_2CO_3
- 20) $\text{CO}_2\uparrow$



- 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



- 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 ($_{11}\text{Na}$) is greater than that of ($_3\text{Li}$)

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

$$\text{H} = 2,1 \quad \text{O} = 3.5$$

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



8) During the chemical reactions, sodium (${}_{11}\text{Na}$) 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.



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°)

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.

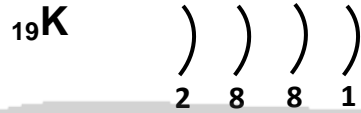
Because pure water is a bad conductor of electricity, but acidified water good conductor of electricity.

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:



Period 4

Group 1A



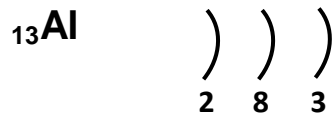
Period 2

Group zero



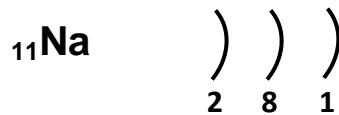
Period 2

Group 1A



Period 3

Group 3A



Period 3

Group 1A



Period 1

Group zero



(5) Find the atomic number for elements in:

1- $\begin{array}{cccc}) &) &) &) \\ 2 & 8 & 8 & 2 \end{array} \rightarrow 20$

2- $\begin{array}{cc}) &) \\ 2 & 2 \end{array} \rightarrow 4$

3- $\begin{array}{ccc}) &) &) \\ 2 & 8 & 8 \end{array} \rightarrow 18$

4- $\begin{array}{cc}) &) \\ 2 & 7 \end{array} \rightarrow 9$

Unit (2)

(1) What is meant by:

1- Atmospheric envelope of the Earth:

It is a gaseous envelope rotating with the Earth around its axis and it extends about 1000 km above the sea level.

2- Atmospheric pressure:

It is the weight of air column above unit area.

3- Isobar

It is curved lines that join the points of equal pressure in atmospheric pressure maps.

4- Tropopause

It is the region between troposphere and stratosphere.



5- Stratopause

It is the region between stratosphere and mesosphere.

6- Mesopause

It is the region between mesosphere and thermosphere.

7- Van Allen belts

They are two magnetic belts surrounding ionosphere and play an important role in scattering of harmful charged cosmic radiations.

8- Aurora phenomenon

It is a phenomenon that appears as brightly coloured light curtains seen from the both poles of the Earth.

9- Exosphere

It is a region in which the atmospheric envelope is inserted with outer space.

10- Global warming phenomenon

It is the continuous increase in the average temperature of the Earth's near surface air.

11- Green house phenomenon

It is the trapping of infrared radiation in the troposphere layer due to the increase of the ratio of greenhouse gases which cause the increase of planet Earth temperature.

(2) Give reasons for:

1- The troposphere layer is called by this name.

Because, all atmospheric phenomena changes take place in it.

2- The upper part of thermosphere layer is called ionosphere.

Because, it contains charged ions.



3- Mesosphere layer is highly rarefied.

Because it contains limited quantities of helium and hydrogen gases only.

4- Mesosphere layer is called by this name.

Because, it is the coldest layer as its temperature decreases as we go up until it becomes -90° .

5- The stratosphere layer is called by ozonic atmospheric envelope.

Due to the presence of ozone layer in it.

6- The last layer of atmospheric envelope is called thermal layer.

Because, it is the hottest layer in atmospheric envelope and the temperature = 1200°C .

Unit (3)

(1) What is meant by:

1) Fossils:

They are traces and remains of old living organisms that are preserved in sedimentary rocks.

2) Traces:

Traces indicate the activity of once an old living organism during its life.

3) Remains:

Parts indicate the remains of once an old living organism after death.

4) Amber:

Solidified resinous matter which was secreted by pine trees in old geologic ages.



5) Solid cast:

It is the replica of the external details of a skeleton of once an old living organism.

6) Mold:

It is the replica of the internal details of a skeleton of once an old living organism.

7) Petrified fossils:

They are fossils, in which minerals replace the organic matter for organism part by part leaving the shape without any change.

8) Petrified woods:

They are fossils which are formed as a result of replacing the organic matter of wood by the silica part by part and they give us details about the life of once an old plant.

9) Extinction

It is the continuous decrease without compensation in the number of a certain species of living organisms until all members die.

10) Natural protectorates:

They are safe areas established to protect endangered species in their homeland.

11) Complicated ecosystem:

It is an ecosystem that has multiple members and it is not affected much by the absence of one of its species.

12) Simple ecosystem:

It is an ecosystem that has a few members and it is severely affected by the absence of one of its species.



13) Food chain

It is the path of energy that transmits from a living organism to another in the ecosystem.

14) The moment of extinction

It is the date of death of the last individual of that species.

Give reasons for:

1- Removing trees of tropical forests is one of the most important factors of extinction.

Because, cutting down forests causes living organisms to be stray and homeless.

2- Bald eagle is from endangered species.

Because, it feeds on fish that contain poisonous matter that is being dumped in lakes and rivers.

3- The desert ecosystem is significantly affected by the absence of one its species.

Due to the absence of alternative that compensates the absence of species.

4- UNESCO has chosen Wadi Hetan area as the best world heritage area for whales skeletons.

Because it contains complete whales, fossils 40 million years ago.

5- Bluestone is an important natural protectorate.

Because, it protects grey bear from the danger of extinction.



6- Scientists attempt to establish a gene bank for some types of living organisms.

To protect rare and endangered living organisms.

7- Scarcity of bamboo plant.

Because it doesn't blossom except once every 100 year.

8- Disappearance of papyrus upper Nile.

Due to drying of swamps where they grow.

9- Ammonites fossil is classified as a mold fossil.

Due to formation of a replica of the internal details of a shell of ammonites.

10- Formation of petrified woods fossils.

Due to replacing the organic matter of wood by silica part by part.

11- Naming the petrified forest with wood mountain.

Because, it contains petrified woods which look like rocks.

12- The petrified woods are considered from fossils although they look like rocks.

Because, they give us the details about the life of once an old plant.

13- Gebel El-Mokattam was a part of a sea floor more than 35 million years ago.

Due to the presence of nummulites fossils in the limestone rocks of Gebel El-Mokattam.