



Questions

Unit (1)

(1) Give reasons for each of the following:

- 1- Equal masses of different substances have different volumes.
or Equal volumes of different substances have different masses.
- 2- The iron nail and the metallic coin sink in water while the piece of wood floats on the water surface.
- 3- Water is not used to extinguish petrol fires.
- 4- Balloons filled with hydrogen or helium rise up in air carrying flags.
- 5- Melting point is used to separate between different substances.
- 6- Electric wires are made of copper or aluminium.
- 7- Screw driver are made of steel, while their handles are made of wood or plastic.
- 8- Cooking pans are made of aluminium.
- 9- Handles of cooking pans are made of wood or plastic.
- 10- Sodium and potassium are kept under kerosene surface.
- 11- Steel bridges and the holders of light bulb are painted from time to time.
 - Metallic spare parts of cars are covered with grease.
- 12- Washing of cooking pans made of aluminium with a rough material.
- 13- Silver and gold are used in making jewels.



- 14- Nickel, gold and silver are used to cover other substances which rapidly gain rust.
- 15- When you leave the perfume bottle opened, you smell it all over the room.
- 16- A drop of ink spreads through water.
- 17- The volume of a mixture of water and alcohol is less than the sum of their volumes before mixing.
- 18- It is difficult to break an iron piece with your hand.
- 19- The atom is electrically neutral in its ordinary state.
- 20- The mass of the atom is concentrated in the nucleus.
- 21- The nucleus is positively charged.
- 22- Nobel gases don't enter a chemical reaction through ordinary conditions.
- 23- When adding an amount of table salt to water it disappears after a time.

(2) What' meant by:

- | | |
|-------------------------|---------------------------|
| 1- Density | 2- Melting point |
| 3- Molecule | 4- Intermolecular spaces |
| 5- Intermolecular force | 6- Latent heat of melting |
| 7- Element | 8- Compound |
| 9- Atom | 10- Atomic number |
| 11- Mass number | 12- Energy levels |
| 13- Quantum of energy | 14- The excited atom |



(3) Problem

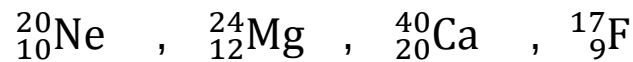
1- What is the density of 35 gm of a substance that occupy 25 cm³

2- In an experiment to determine the density of water, the following results were recorded.

- Mass of an empty beaker = 65 gm.
- Mass of the beaker and water = 165 gm
- The volume of water = 100 cm³.

Calculate the density of water.

(4) Show the electronic configuration of the following elements:





Model Answers

Unit (1)

(1) Give reasons for each of the following:

1- Equal masses of different substances have different volumes.

or Equal volumes of different substances have different masses.

Because they have different densities.

2- The iron nail and the metallic coin sink in water while the piece of wood floats on the water surface.

Because coin and nail have density higher than water while piece of wood has density lower than water.

3- Water is not used to extinguish petrol fires.

Because the density of petrol is less than that of water so, petrol floats on water surface and doesn't put out the fire.

4- Ballons filled with hydrogen or helium rise up in air carrying flags.

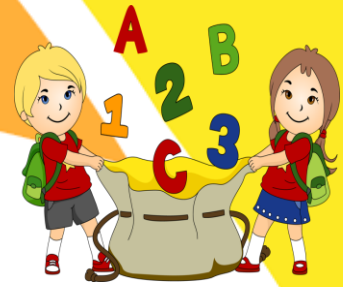
Because the densities of hydrogen and helium are less than the density of air.

5- Melting point is used to separate between different substance.

Because each substance has a definite melting point which differs from the others.

6- Electric wires are made of copper or aluminium.

Because they are good conductors of electricity.



7- Screw driver are made of steel, while their handles are made of wood or plastic.

Because steel is a good conductor of electricity but wood and plastic are bad conductors of electricity.

8- Cooking pans are made of aluminium.

Because it is a good conductor of heat and it has a high melting point and it is easy to transfer heat.

9- Handles of cooking pans are made of wood or plastic.

Because wood and plastic are bad conductors of heat.

10- Sodium and potassium are kept under kerosene surface.

To prevent their reaction with atmospheric oxygen as they are active metals.

11- Steel bridges and the holders of light bulb are painted from time to time.

- Metallic spare parts of cars are covered with grease.

To protect them from rust and corrosion.

12- Washing of cooking pans made of aluminium with a rough material.

To remove any layer formed on them.

13- Silver and gold are used in making jewels.

Because they are chemically poor active.

14- Nickel, gold and silver are used to cover other substances which rapidly gain rust.

To protect them from rust and corrosion.

15- When you leave the perfume bottle opened, you smell it all over the room.

Because the molecules of the perfume are in continuous motion and they keep the properties of perfume.



16- A drop of ink spreads through water.

Because the molecules of ink are in a continuous motion in all directions among water molecules.

17- The volume of a mixture of water and alcohol is less than the sum of their volumes before mixing.

Because some molecules of alcohol occupy the intermolecular spaces among water molecules.

18- It is difficult to break an iron piece with your hand.

Because there are strong attraction force (intermolecular force) among iron molecules.

19- The atom is electrically neutral in its ordinary state.

Because the number of positive protons inside the nucleus is equal the number of negative electrons which revolve around it.

20- The mass of the atom is concentrated in the nucleus.

Because the electron has a negligible mass relative to that of proton or neutron.

21- The nucleus is positively charged.

Because it contains protons that positively charged particles and neutrons that electrically neutral particles.

22- Nobel gases don't enter a chemical reaction through ordinary conditions.

Because the outermost energy levels of their atoms are completely filled with electrons.

23- When adding an amount of table salt to water it disappears after a time.

Due to the presence of the inter molecules space among water molecules.



(2) What' meant by:

1- Density:

It is the mass of unit volume of matter. $D = \frac{m}{v}$

2- Melting point:

It is the temperature at which matter begins to change from a solid state to a liquid state.

3- Molecule:

It is the smallest part of matter which can exist freely and it has the properties of matter.

4- Intermolecular spaces:

They are the spaces that found among the molecules.

5- Intermolecular force:

It is the force that bonds the molecules together.

6- Latent heat of melting:

It is the amount of heat required to change 1 kg. of substance from solid state to the liquid state without changing in the temperature [although heating is continued]

7- Element:

It is the simplest pure form of matter which can't be analyzed chemically into simple form & it composed of similar atoms.

8- Compound:

It is a substance which is formed from combination of atoms of two or more different elements with constant weight ratios.

9- Atom:

- It is the fundamental building unit of matter
- It is the smallest individual unit of matter which can share in chemical reaction.



10- Atomic number:

It is the number of protons in the nucleus of an atom and = number of electrons.

11- Mass number:

It is the sum of the numbers of protons and neutrons in the nucleus of an atom.

12- Energy levels:

They are imaginary regions around the nucleus in which the electrons move according to their energies.

13- Quantum of energy:

It is the amount of energy lost or gained by an electron when it transfers from one energy level to another.

14- The excited atom:

It is the atom that gains a quantum of energy.

(3) Problem

1- What is the density of 35 gm. of a substance that occupy 25 cm³

$$D = \frac{m}{v}$$

$$m = 35 \text{ gm}$$

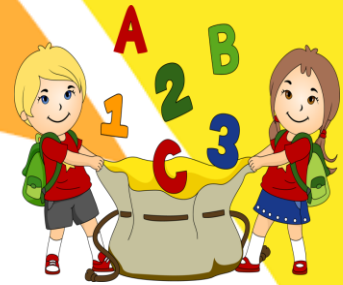
$$V = 25 \text{ cm}^3$$

$$\therefore D = \frac{35}{25} = 1.4 \text{ gm/cm}^3$$

2- Mass of water = 165 – 65 = 100 gm

$$D = \frac{m}{v} = \frac{100}{100}$$

$$D = 1 \text{ gm / cm}^3$$



(4) Show the electronic configuration of the following elements:

