UNIT 11 - AIR

Class: VIII

Subject: Science

I. Choose the best answer.

1. Which of the following is true about oxygen?

a) Completely burning gas b) Partially burning gas

c) Doesn't support burning **d) Supports burning**

2. Aerated water contains

a) air b) oxygen **c) carbon dioxide** d) nitrogen

3. Solvay process is a method to manufacture

a) lime water b) aerated water c) distilled water **d) sodium carbonate**

4. Carbon dioxide with water changes

a) blue litmus to red b) red litmus to blue

c) blue litmus to yellow d) doesn't react with litmus

5. Which of the following is known as azote?

a) Oxygen **b) Nitrogen** c) Sulpher d) Carbon dioxide

II. Fill in the blanks.

1 . **Oxygen** is called as vital life.

2. Nitrogen is **lighter** than air.

3. **Nitrogen** is used as a fertilizer.

4. Dry ice is used as a **refrigerant**.

5. The process of conversion of iron into hydrated form of oxides is called **rusting**

III. Match the following.

1. Nitrogen - Fertilizer

2. Oxygen - Respiration in living animals

3. Carbon dioxide - Fire extinguisher

4. Dry ice - Refrigerator

IV. Answer briefly.

1. Mention the physical properties of oxygen.

- Oxygen is a colourless, odourless and tasteless gas.

- It is a poor conductor of heat and electricity
- Oxygen dissolves readily in cold water.
- It is denser than air.
- It can be made into liquid (liquified) at high pressure and low temperature.
- It supports combustion.

2. List out the uses of nitrogen.

- Liquid nitrogen is used as a refrigerant. It provides an inert atmosphere for conducting certain chemical reactions.
- It is used to prepare ammonia (by Haber's process) which is then converted into fertilizers and nitric acid.
- Nowadays it is used as a substitute for compressed air in tyres.
- It is used for filling the space above mercury in high temperature thermometer to reduce the evaporation of mercury.
- Many explosives such as TNT (Trinitrotoluene), nitroglycerin, and gun powder contain nitrogen.
- It is used for the preservation of foods, manufacturing of stainless steel, reducing fire hazards, and as part of the gas in incandescent light bulbs.

3. Write about the reaction of nitrogen with non metals.

Nitrogen reacts with non-metals like hydrogen, oxygen etc., at high temperature to form their corresponding nitrogen compounds.

$$\text{Non-metal} + \text{Nitrogen} \xrightarrow{\Delta} \text{Nitrogen compound}$$

Example

$$\underset{\text{Hydrogen}}{3H_2} + \underset{\text{Nitrogen}}{N_2} \xrightarrow{\Delta} \underset{\text{Ammonia}}{2NH_3}$$

4. What is global warming?

- The green house gases are CO2, N2O, CH4, CFC (Chlorofluoro carbon) etc.
- The increase in the levels of these gases results in the gradual increase of temperature of the earth's surface.

- This green house effect is caused due to increase in the air pollutants and it results in the average increase of temperature of the atmosphere. This is called as Global warming.

5. What is dry ice? What are its uses?

Solid carbon dioxide, called as dry ice is used as a refrigerant. The gas is so cold that moisture in the air condenses on it, creating a dense fog which is used in stage shows and movie effects.

V. Answer in detail.

1. What happens when carbon dioxide is passed through lime water? Write the equation for this reaction.

When a limited amount of CO2 is passed through lime water, it turns milky due to the formation of insoluble calcium carbonate.

$$Ca(OH)2 + CO2 \rightarrow CaCO3 + H2O$$

When an excess amount of CO_2 is passed through lime water, it first turns milky and the milkyness disappears due to the formation of soluble calcium hydrogen carbonate, Ca $(HCO_3)2$.

2. Name the compounds produced when the following substances burn in oxygen.

a) Carbon b) Sulphur c) Phosphorous d) Magnesium e) Iron f) Sodium

C	Carbon dioxide (CO_2)
S	Sulphur dioxide (SO_2)
P	Phosphorus trioxide (P_2O_3) (or) Phosphorus pentoxide (P_2O_5)
Mg	Magnesium Oxide (MgO)
Fe	Iron Oxide (Fe $_2$O3)
Na	Sodium Oxide (Na $_2$O)

3. How does carbon dioxide react with the following?

a) Potassium b) Lime water c) Sodium hydroxide

1. Potassium combine with CO2 to form potassium carbonate.

$$4K + 3CO_2 \rightarrow 2K_2CO_3 + C$$

When a limited amount of CO2 is passed through lime water, it turns milky due to the formation of insoluble calcium carbonate.

$$Ca(OH)_2 + CO_2 \rightarrow CaCO_3 + H_2O$$

(Calcium carbonate)

Sodium hydroxide (base) is neutralized by carbon dioxide (acidic) to form sodium carbonate (salt) and water.

4. What are the effects of acid rain? How can we prevent them?

- Acid rain affects us in many ways. Some of the consequences are given below.
- It irritates eyes and skin of human beings.
- It inhibits germination and growth of seedlings.
- It changes the fertility of the soil, destroys plants and aquatic life.
- It causes corrosion of many buildings, bridges, etc.

Preventive measures:

Acid rain and its effects can be controlled by the following ways.

- Minimizing the usage of fossil fuel such as petrol, diesel etc.
- Using CNG (Compressed Natural Gas).
- Using non – conventional source of energy.
- Proper disposal of the industrial wastes.

VI. Higher Order Thinking Questions.

1. Soda bottle bursts sometimes when it is opened during summer. Why?

- In soda bottle carbon dioxide gas is dissolved in water under pressure.
- The gas in the bottle expands.
- Hence, the pressure inside the bottle increases.
- Thus the bottle may burst in hot summer.

2. It is said that sleeping beneath the tree during night is not good for health. What is the reason?

During night trees absorb oxygen and release carbon dioxide. Therefore, anyone who sleeps under tree, will not get oxygen, which can cause breathing problems, suffocation etc.

3. Why does the fish die when it is taken out of water?

- Gills are richly supplied with blood capillaries and can readily absorb the oxygen dissolved in water.
- When fishes are taken out of water, the supply of oxygen to the fishes is cut as the fishes cannot absorb and breathe using the oxygen present in the atmosphere.
- Hence they die, when it is taken out of water.

4. How do astronauts breathe when they go beyond earths atmosphere?

- Astronauts cannot breathe in space unless they carry their own oxygen with them.
- They can make their own oxygen by using energy from the solar arrays to split hydrogen and oxygen from water.