

## NON METALS: Model Questions & Answers.

1. Find out the element from the following which is not existed in free state?

a. Nitrogen b. Oxygen. c. Chlorine.

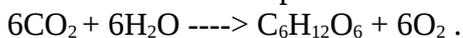
**Ans.** c. Chlorine

2. Identify the prime gas present in the atmosphere. **Ans.** Nitrogen.

3. "The plants play the main role for maintaining the level of oxygen constant in the atmosphere."

Justify this statement.

**Ans.** This statement is true. Because photosynthesis is the process that maintains the the level of oxygen constant in the atmosphere.



During this process, plants receive carbon dioxide from the atmosphere and releases oxygen to the atmosphere.

4. Which is the most abundant element in the earth's crust? **Ans.** Oxygen.

5. The incomplete chemical equation for the preparation of oxygen is given.

..... + heat ----> potassium manganate + manganese dioxide + oxygen.

a. Complete the equation. b. Write down an experiment to detect the presence of oxygen.

c. List out the physical properties of oxygen. d. Give a few uses of oxygen.

e. Name the triatomic molecule of oxygen.

f. Which is the atmospheric layer where this triatomic molecule of oxygen is seen?

**Ans.** a. potassium permanganate + heat ----> potassium manganate + manganese dioxide + oxygen.

b. Bring a glowing splinter in oxygen, then it will flare up.

c. Oxygen is a colourless and odourless gas. And its density is greater than that of air.

d. For combustion, As oxidant in rocket fuels, for artificial respiration. e. Ozone. f. Stratosphere.

6. Ozone is mostly present in stratosphere.

a. Which is the radiation that maintains the level of ozone remain constant in stratosphere?

b. Name the main compound responsible for the depletion of ozone layer.

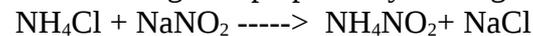
**Ans.** a. Ultraviolet rays. b. CFC ( chloro fluoro carbon)

7. Nitrogen is the most abundant gas in the atmosphere.

a. Explain the preparation of nitrogen in laboratory.

b. How do plants obtain nitrogen for their growth? c. Write down some uses of nitrogen.

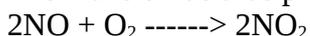
**Ans.** a. Nitrogen is prepared by heating a mixture of ammonium chloride and sodium nitrate.



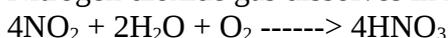
The unstable sodium nitrate so produced is decomposed to give nitrogen.  $\text{NH}_4\text{NO}_2 \text{ ----> } \text{N}_2 + 2\text{H}_2\text{O}$

b. At atmospheric temperature, nitrogen is almost inert. But during lightning, it combines with atmospheric oxygen to form nitric oxide.  $\text{N}_2 + \text{O}_2 \text{ ----> } 2\text{NO}$

The nitric oxide thus produced again combines with oxygen to form nitrogen dioxide.



Nitrogen dioxide gas dissolves in rain water in the presence of oxygen and reaches the soil as nitric acid.



Minerals in the soil reacts with this nitric acid to form nitrate salts which is absorbed by the plants.

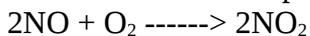
c. For the manufacture of fertilizers, for inflating tyres, liquefied nitrogen is used as refrigerant, for filling in the food packet for preventing staleness of the food content.

8. Why it is said that lightning is a boon to plants?

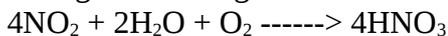
**Ans.** Because it is by lightning plants get nitrogen for their growth.

At normal atmospheric temperature, nitrogen is almost inert. But during lightning, it combines with atmospheric oxygen to form nitric oxide.  $\text{N}_2 + \text{O}_2 \text{ ----> } 2\text{NO}$

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9. We provide bio-fertilizers and chemical fertilizers for plants. Write down the merits and limitations of the application of both.

**Ans.** i. Bio – fertilizers do not destroy innate nature of the soil but chemical fertilizers destroy the same.

ii. Unlike chemical fertilizers, bio – fertilizers are to be added in large quantity.

10. A non metal which is the first element in the periodic table is the most abundant element in the universe.

a. Which is this element? b. Suggest an experiment to confirm its presence.

c. Why do the balloons filled this gas raises up?

**Ans.** a. Hydrogen. b. Bring a lighted match stick in hydrogen, it will burn with pop sound.

c. Because density of hydrogen is less than that of air.

11. Water is formed by the combustion of hydrogen in oxygen.

a. Name two isotopes of hydrogen. b. What is heavy water? c. Write down two uses of heavy water.

**Ans.** a. Deuterium & tritium. b. Deuterium oxide ( $D_2O$ ) is called heavy water.

c. i. Used as a moderator in nuclear reactors. ii. Used for the preparation of deuterium.

12. Hydrogen is a substance that releases large amount of heat during combustion.

a. What is meant by calorific value? b. List out the merits of hydrogen as a fuel.

c. In spite of many merits, hydrogen could not be used as a fuel. Why?

**Ans.** a. The amount of heat energy released during the complete combustion of one kilogram (unit mass) of a fuel is its calorific value.

b. (i). High calorific value. (ii). Doesn't make any pollution due to combustion.

c. i. Hydrogen is a gas that burns explosively in air. Its storage and distribution is difficult.

13. Chlorine is a non metal that used for the preparation of bleaching powder.

a. Why chlorine is not present in free state in nature?

b. List out the materials for the preparation of chlorine in the laboratory.

**Ans.** a. Because chlorine is highly reactive element.

b. Concentrated hydrochloric acid and potassium permanganate.

14. It is given the balanced equation for the preparation chlorine in the laboratory.



a. What are the substances through which chlorine is passed before it is collected?

b. Why chlorine is passed through these substances?

c. Chlorine is collected by upward displacement of air. From this, what information do you get about the density of chlorine? d. Give two more physical properties of chlorine.

**Ans.** a. Through water and sulphuric acid.

b. The chlorine coming out of the flask contains HCl vapour and water vapour. HCl vapour and water vapour are removed by passing the chlorine gas through water and sulphuric acid respectively.

c. Density of chlorine is greater than that of air. d. Chlorine is gas having pungent smell and pale green colour.

15. Chlorine can bleach coloured substance.

a. What is bleaching? b. Which is the reaction that made possible chlorine to bleach the substances?

c. Write down a few uses of chlorine.

**Ans.** a. Bleaching is the de-colourisation of coloured substances. b. Oxidation.

c. i. For bleaching ii. for the preparation of insecticides & bleaching powder.

16. Bleaching powder is used for the purification of water. Explain the method of the preparation of bleaching powder.

**Ans.** Chlorine gas is prepared by passing chlorine gas over dry slaked lime.

17. Name of a few chemicals are given below.

Sulphuric acid, Hydrochloric acid, Sodium nitrate, Potassium permanganate, Ammonium chloride, zinc and water. Find out the substance required for the preparation of nitrogen, hydrogen and Oxygen.

**Ans.** (i). Nitrogen: Sodium nitrate & Ammonium chloride.

(ii). Hydrogen: Hydrochloric acid, zinc and water. (iii). Oxygen: Potassium permanganate.

18. Identify the gases related to the following statements.

a. Inflammable gas obtained by the electrolysis of water.

b. Gas known as 'the breath of life'.

c. Gas which is mainly responsible for the depletion of the ozone layer.

d. Gas which is not present in the free state and having pale green colour.

e. Gas released by the decomposition of  $KMnO_4$ .

f. Gas used for the preparation insecticides.

g. Gas released by the bio-degradation and is essential for the growth of plants.

**Ans.** a. Hydrogen. b. Oxygen c. Chlorine. d. Chlorine. e. Oxygen. f. Chlorine. g. Nitrogen.