

## THE ATMOSPHERE

### Long Answer Questions

**Q.1 What is the role of CO<sub>2</sub> in atmosphere?**

**Ans. Role of CO<sub>2</sub> in Atmosphere:**

The CO<sub>2</sub> forms a layer around the Earth like an envelope. It allows the heat rays of the Sun to pass through it and reaches up to the Earth. These rays are reflected from the Earth surface and go back to upper atmosphere.

Normal concentration of CO<sub>2</sub> layer retains enough heat to keep the atmosphere warm. So, normal concentration of CO<sub>2</sub> is necessary and beneficial for keeping the temperature warm. Otherwise, the Earth would have been uninhabitable. The Earth's average temperature would be about -20°C, rather than presently average temperature 15°C.

**Q.2 What are the effects of global warming?**

**Ans. Effects of Global Warming:**

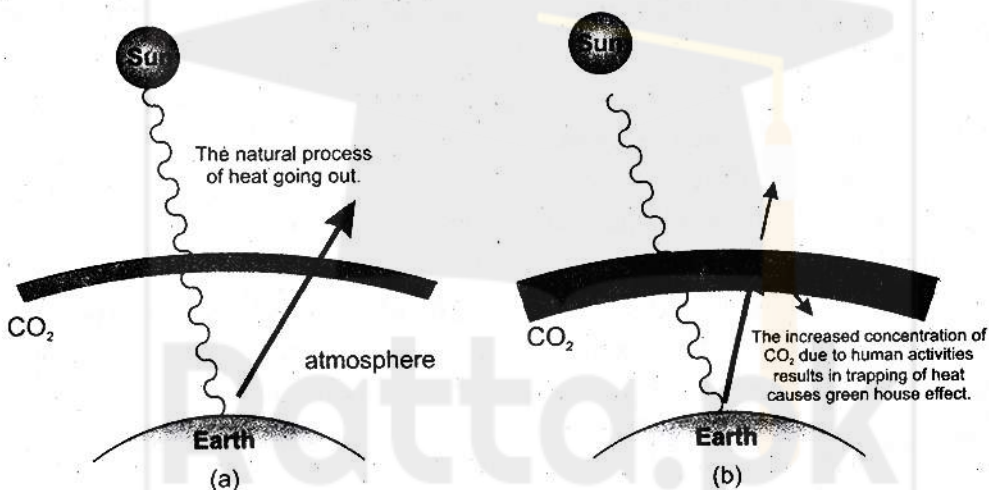
- (i) Accumulation of carbon dioxide in air is resulting in increasing atmospheric temperature about 0.05 °C every year.
- (ii) It is causing major changes in weather patterns. Extreme weather events are occurring more commonly and intensely than previously.
- (iii) It melts glaciers and snow caps that are increasing food risks and intense tropical cyclones.
- (iv) Sea-level is rising due to which low lying areas are liable to be submerged, turning previously populated areas no longer habitable.

**Q.3 Write a note on Green House Effect?**

**Ans. Green House Effect:**

Although CO<sub>2</sub> is not a poisonous gas, yet its increasing concentration due to burning of fossil fuels in different human activities is alarming. Because CO<sub>2</sub> in the atmosphere acts like a glass wall of a green house. It allows UV radiations to pass through it but does not allow the IR radiations to pass through it. It traps some of the infrared radiations emitted by the Earth. Hence, increased concentration of CO<sub>2</sub> layer absorbs the infrared radiations emitted by

the Earth's surface and prevents heat energy escaping from the atmosphere. It helps to stop surface from cooling down during night. As the concentration of  $\text{CO}_2$  in air increase, less heat energy is lost from the surface of the Earth. Therefore, the average temperature of the surface gradually increases. This is called greenhouse effect as shown in figure. This effect is proportional to amount of  $\text{CO}_2$  in air. Greater is amount of  $\text{CO}_2$ , more is trapping of heat or warming. Due to increased warming this phenomenon is also called global warming.



**Q.4 Is CO an air pollutant? If yes, What are its effect on human health?**

**Ans.** CO is an air pollutant. It is a health hazard being highly poisonous gas. Being colorless and odorless, its presence cannot be noticed easily and readily. When inhaled, it binds with the hemoglobin most strongly than that of oxygen. Thus, hindering the supply of oxygen in body. Exposure to higher concentration of CO causes headache and fatigue. If inhaled for a longer time it results in breathing difficulties and ultimately death. It is the reason burning is not allowed in closed places. It is advised to switch off coal or gas heaters, cooking range, etc., before going to sleep.

**Q.5 What should be the role of Government to control pollution?**

**Ans. Role of Government to Control Pollution:**

**(i) Quality of Fuel**

First of all, quality of fuel must be improved by adding anti-knocking agents in fuels .at the same time, automobiles combustion engines must be efficient so that they should burn the fuel completely. No unburned hydrocarbon molecules (fuel) should come out of the exhaust. So government must guide the people to use converters in auto exhausts.

**(ii) Alternative Fuel**

Fossil fuel produces a number of air pollutants because of impurities and complex molecule nature of hydrocarbons. Government should promote the use of alternative fuels

such as methanol, ethanol and bio-diesel. These fuels are less polluting than hydrocarbons fuel, as their molecules are simple, and burn completely in the engine. Their burning produces less carbon monoxide, soot and other pollutants.

### (iii) **Battery-powered Electric Vehicles**

The government must plan to avoid using carbon dioxide producing fuels as it is a greenhouse gas. It should go to battery-powered electric vehicles.

Government should provide efficient transport in the big cities, so that people should avoid using their own vehicles.

### **Q.6 How acid rain is formed? Explain**

#### **Ans. Formation of Acid Rain:**

The burning of fossil fuels produces oxides of sulphur and nitrogen in air. Rain water converts  $\text{SO}_2$  into  $\text{H}_2\text{SO}_4$  and  $\text{NO}_x$  to  $\text{HNO}_2$  and  $\text{HNO}_3$ . Normal rain water is weakly acidic because it consists of dissolved  $\text{CO}_2$  of the air. Its pH is about 5.6 to 6. But rain water on dissolving air pollutants (acids) becomes more acidic and its pH reduces to 4. Thus, acid rain is formed on dissolving acidic air pollutants such as sulphur dioxide and nitrogen dioxide by rain water.

### **Q.7 Write harmful effects of acid rain?**

#### **Ans. Harmful Effects of Acid Rain:**

##### **(i) Effects on Aquatic Life**

Acid rain on soil and rocks leaches heavy metals (Al, Hg, Pb, Cr, etc) with it and discharges these metals into rivers and lakes. This water is used by human beings for drinking purpose. These metals accumulate in human body to a toxic level. On the other hand, aquatic life present in lakes also suffers because of high concentration of these metals. Especially high concentration of aluminium metal clogs the fish gills. It causes suffocation and ultimately death of fish.

##### **(ii) Effects on Buildings and Monuments**

Acid rain attacks the calcium carbonate present in the marble and limestone of buildings and monuments. Thus, these buildings are getting dull and eroded day by day.

##### **(iii) Effects on Soil**

Acid rain increases the acidity of the soil. Many crops and plants cannot grow properly in such soil. It also increases the toxic metals in the soil that poisons the vegetation. Even old trees are being affected due to acidity of soil. Their growth is retarded. They get dry and die.

##### **(iv) Effects on Trees and Plants**

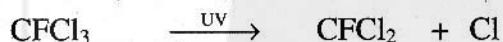
Acid rain directly damages the leaves of trees and plants, thus limiting their growth. Depending upon the severity of the damage, plants growth can be hampered.

### Q.8 How ozone layer is depleted? Explain

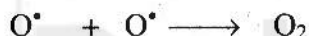
#### Ans. Depletion of Ozone Layer:

Ozone layer is being depleted through various chemical reactions, such as

- (i) The ozone molecule absorbs solar radiations and dissociate readily, i.e., self dissociation of ozone takes place.
- (ii) However, chlorofluorocarbons (CFCs) (used as refrigerants in air conditioners and refrigerators) are major cause of depletion of ozone layer. These compounds leak in one way or other escape and diffuse to stratosphere. These ultraviolet radiations break the C-Cl bond in  $\text{CFCl}_3$  and generates chlorine free radicals as



These free radicals are very reactive. They react with ozone to form oxygen as



A single chlorine free radical released by the decomposition of CFCs is capable of destroying up to many lacs of ozone molecules. The region in which ozone layer depletes is called ozone hole.

### Q.9 What are the after effects of ozone layer depletion?

#### Ans: Effects of Depletion on Ozone Layer:

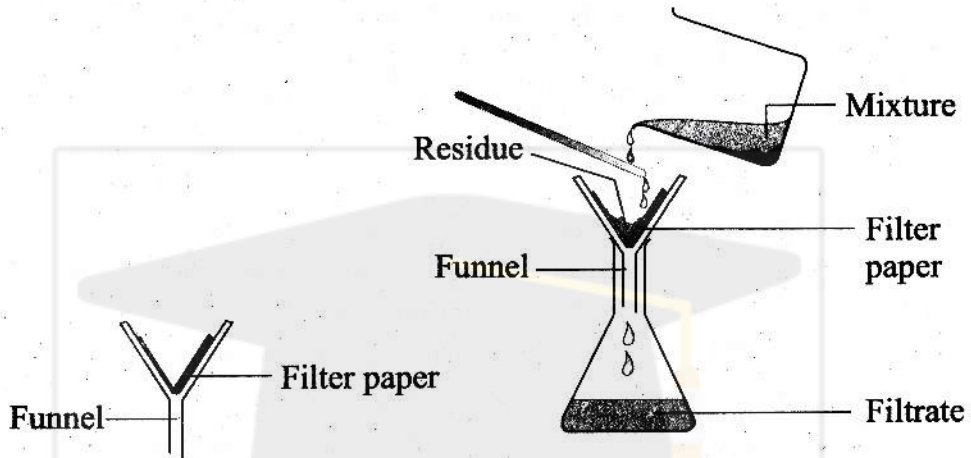
Even minor problems of ozone depletion can have major effects.

- (i) Depletion of ozone enables ultraviolet radiations of Sun to reach to the Earth, that can cause skin cancer to human beings and other animals.
- (ii) Decreased ozone layer will increase infections disease like malaria.
- (iii) It can change the life cycle of plants disrupting the food chain.
- (iv) It can change the wind patterns, resulting in climatic changes all over the world. Especially, Asia and Pacific will be the most affected regions, facing climate induced migration of people crisis.

### Q.10 How the process of filtration is carried out? Explain

Ans: A filter paper is first folded half way, and then another fold is made, so that a filter paper gets four folds. This folded filter paper is placed in a filter funnel in such a way that on one side is three layers and on the other side is one layer as shown in figure.

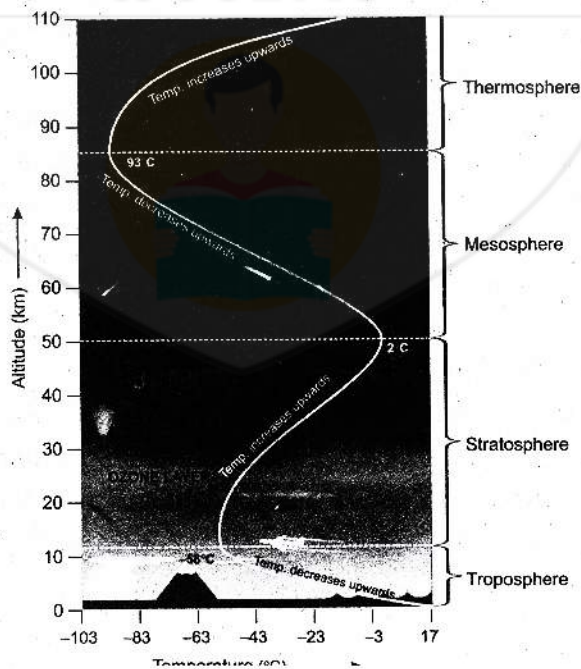
The mixture (sand in water or chalk in water) is poured into the filter paper as shown in figure.



Filtrate passes through the filter paper and is collected in a conical flask. The solid particles (residue) deposit on the filter paper. It is then dried.

**Q.11 How atmosphere is divided on the basis of variation in temperature? Explain**

Ans: Depending upon the temperature variation, atmosphere is divided into four regions. Temperature decreases from  $17^{\circ}\text{C}$  to  $-58^{\circ}\text{C}$  regularly in the lowest layer extending upto 12 km. This layer of atmosphere is called troposphere. Above this layer lies the stratosphere that extends upto 50 km. In this layer temperature rises upto  $2^{\circ}\text{C}$ . Beyond the stratosphere lies the mesosphere, covering upto 85 km. In this region again temperature decreases down to  $-93^{\circ}$ . Beyond 85 km lies the thermosphere in which temperature goes on increasing upwards.



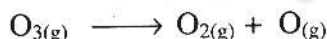
### Characteristics of Atmospheric Regions

Name of Region	Height above the Earth Surface	Temperature range and Trend
Troposphere	0 — 12 km	17°C — -58°C (decreases)
Stratosphere	12 — 50 km	-58°C — 2°C (increases)
Mesosphere	50 — 85 km	2°C — -93°C (decreases)
Thermosphere	85 — 120 km	> -93°C (increases)

#### Q.12 How ozone is formed in stratosphere? Explain

##### Ans. Formation of Ozone Layer

This atmospheric region is next to troposphere and extends upto 50 kilometers. In this region, temperature rises gradually upto 2°C. The presence of ozone (due to absorption of radiation) in this region is responsible for the rise of temperature in stratosphere. Within this region, temperature increases as a altitude increases, such as lower layer temperature is about - 58°C and upper layer is about 2°C. Thus, stratosphere is layered in temperature. Since ozone in the upper layer absorbs high energy ultraviolet radiations from the Sun, it breaks down into monoatomic (O) and diatomic oxygen (O<sub>2</sub>).



The mid stratosphere has less UV light passing through it. Here O and O<sub>2</sub> recombine to form ozone which is an exothermic reaction. Ozone formation in this region results in formation of ozone layer. Thus, ozone layer exists in mid stratosphere.



The lower stratosphere receives very low UV radiations, thus monoatomic oxygen is not found here and ozone is not formed here.

#### Q.13 Write a note on troposphere?

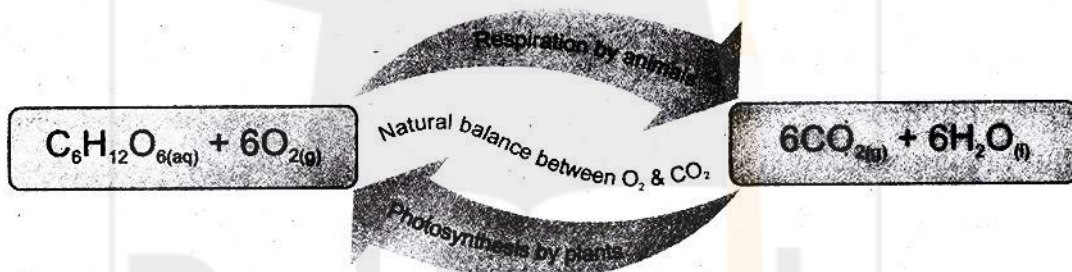
##### Ans. Troposphere

The major constituents of troposphere are nitrogen and oxygen gases. These two gases comprise 99% by volume of the Earth's atmosphere.

Although concentration of carbon dioxide and water vapours is negligible in atmosphere, yet they play a significant role in maintaining temperature of the atmosphere. Both of these gases allow visible light to pass through but absorb infrared radiations emitted by the Earth's surface. Therefore, these gases absorb much of the outgoing radiations and warm the atmosphere. As the concentration of gases decreases gradually with the increases of altitude, correspondingly temperature also decreases at a rate of 6K per kilometer. This is the region where all weathers occur. Almost all aircrafts fly in this region.

**Q.14 Is CO<sub>2</sub> an air pollutant? How a natural balance exists between CO<sub>2</sub> and O<sub>2</sub> in atmosphere.**

**Ans.** CO<sub>2</sub> is not an air pollutant. Rather, it is an essential gas for plants as O<sub>2</sub> is essential for animals. Plants consume CO<sub>2</sub> in photosynthesis process and produce O<sub>2</sub>. While animals use O<sub>2</sub> in respiration and give out CO<sub>2</sub>. In this way, a natural balance exists between these essential gases as represented here. But this balance is being disturbed by emitting more and more CO<sub>2</sub> in air through different human activities.



### Short Answer Questions

**Q.1 What is meant by atmosphere?**

**Ans.** Atmosphere is the envelope of different gases around the Earth. It extends continuously from the Earth's surface outwards without any boundary. About 99% of atmospheric mass lies within 30 kilometers of the surface and 75% lies within the lowest 11 kilometers.

**Q.2 Write composition of dry air.**

**Ans.**

Gas	% by Volume
Nitrogen	78.09
Oxygen	20.94
Argon	0.93
Carbon dioxide	0.03

**Q.3 What is the difference between primary and secondary pollution.**

**Ans.** Primary pollutants are the waste or exhaust products driven out because of combustion of fossil fuels and organic matter. These are the oxides of sulphur (SO<sub>2</sub> and SO<sub>3</sub>); oxides of

carbon ( $\text{CO}_2$  and  $\text{CO}$ ); oxides of nitrogen (specially nitric oxide  $\text{NO}$ ); hydrocarbon ( $\text{CH}_4$ ); ammonia and compounds of fluorine.

Secondary pollutants are produced by various reactions of primary pollutants. These are sulphuric acid, nitric acid, hydrofluoric acid, ozone and peroxy acetyl nitrate (PAN)

#### **Q.4 What are the sources of $\text{CO}_2$ and $\text{CO}$ ?**

**Ans.**

- (a) Both of these gases are emitted due to volcanic eruption and decomposition of organic matter naturally.
- (b) The major source for the emission of these gases is combustion of fossil fuels (coal, petroleum and natural gas). Fossil fuels burnt in combustion engine of any type of automobile, kiln of any industry, or open air fires emit  $\text{CO}_2$  and  $\text{CO}$ .
- (c) Forest fires and burning of wood also emit  $\text{CO}_2$  and  $\text{CO}$ . Especially, when supply of oxygen is limited, emission of  $\text{CO}$  dominates.

#### **Q.5 Why converters should be used in automobile exhausts?**

**Ans.** Converters should be used in automobile exhaust so that they convert  $\text{CO}$  to  $\text{CO}_2$  and oxides of nitrogen  $\text{NO}$  to  $\text{N}_2$  before it enters in air.

#### **Q6. Write importance of $\text{CO}_2$ to life on earth.**

**Ans.**  $\text{CO}_2$  is the 'life gas' for plants.  $\text{CO}_2$  absorbs infrared radiations emitted by the Earth. Although  $\text{CO}_2$  is negligible as compared to  $\text{N}_2$  and  $\text{O}_2$ , yet its heat retaining capacity is tremendous. Without  $\text{CO}_2$  life on earth would have been impossible.

#### **Q7. Write occurrence of sulphur compounds in the atmosphere.**

**Ans.** Naturally occurring sulphur containing compounds are emitted in the bacterial decay of organic matter, in volcanic gases and forest fires. But the concentration of sulphur containing compounds in the atmosphere because of natural sources is very small as compared to the concentration of those compounds emitted by fossil fuel combustion in automobiles and industrial units. About 80% of the total  $\text{SO}_2$  is released by the combustion of coal and petroleum products.

#### **Q.8 How $\text{SO}_2$ and $\text{SO}_3$ are formed? How these gases cause air pollution?**

**Ans.** Fossil fuels contain Sulphur → Fossil fuels are burned to produce energy → The sulphur in the fuel forms oxides of sulphur.  $\text{SO}_2$  and  $\text{SO}_3$  → Oxides of sulphur escape into the air. They are air pollutants → Oxides of sulphur dissolve in water and form Acid Rain. That falls on the earth.

**Q.9 What are the effects of SO<sub>2</sub> gas? Also writes its properties / characteristics.**

**Ans.** It cause suffocation, irritation SO<sub>2</sub> forms sulphuric acid which damages buildings and vegetations. SO<sub>2</sub> is a colourless gas having irritating smell.

**Q.10 How to control pollution because of sulphur?**

**Ans.** To control pollution because of SO<sub>2</sub>. It is necessary to remove sulphur from fossil fuels before they are burnt.

**Q.11 How nitric oxide is produced in air?**

**Ans.** naturally occurring oxides of nitrogen, mainly nitric oxide (NO), is produced by the electrical lightening in air.

**Q.12. How nitric oxide is produced by the combustion of fossil fuels?**

**Ans.** Combustion of fossil fuels in internal combustion engine in thermal power stations and factories where huge amount of coal is burnt, NO is formed by the direct combination of nitrogen and oxygen.



**Q.13 How nitric oxide reacts with oxygen?**

**Ans.** Nitric oxide quickly reacts with air to form nitrogen dioxide. NO is highly toxic gas.



**Q.14 How NO and NO<sub>2</sub> are formed? How these gases causes air pollution.**

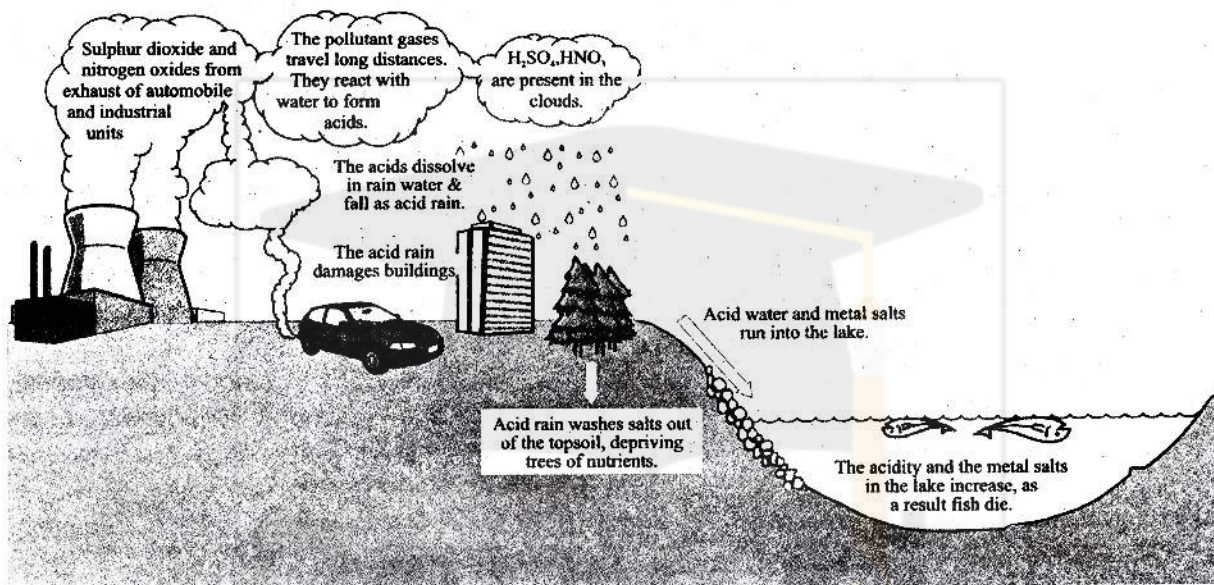
**Ans.** Nitrogen in the air is normally un-reactive → At high temperature it reacts with oxygen to form oxides of nitrogen. NO & NO<sub>2</sub> → These gases escape into the air. They are pollutants → Oxides of nitrogen dissolve in water and form Acid Rain. That falls on the earth.

**Q.15 How the mixture of NO and NO<sub>2</sub> gases are represented? Write their effects.**

**Ans.** Mixture of these gases represented as NO<sub>x</sub> enter in the air through automobile exhaust and chimneys of thermal power station and factories. It irritates breathing passage. These oxide form nitric acid combining with water vapours in air. Nitric acid is a component of acid rain which damage soil, animals, plants and aquatic life.

**Q.16 Sketch the labeled diagram showing the formation of acid rain and its effect**

**Ans:**



**Q.17 What is meant by ozone? How it is formed in atmosphere?**

**Ans.** Ozone is an allotropic form of oxygen consisting of three oxygen atoms. It is formed in atmosphere by the association of an oxygen atom with an oxygen molecule in the mid of stratosphere.

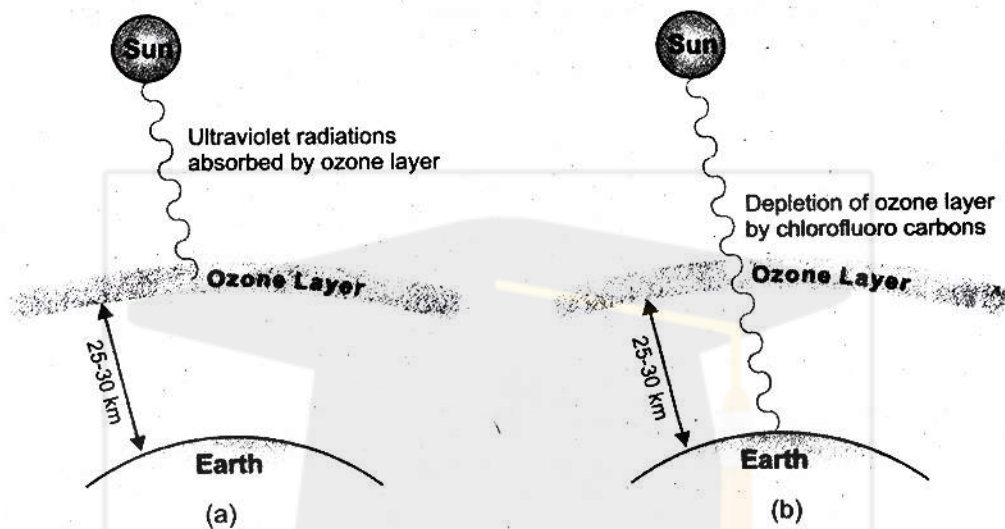


**Q.18 What is meant by Ozone? Where ozone layers exist in atmosphere?**

**Ans.** Ozone is an allotropic form of oxygen. It is represented by  $O_3$ . Ozone is present throughout the atmosphere. But its maximum concentration called ozone layer lies in stratosphere region about 25 to 30 km away from the Earth's surface.

**Q.19 How ozone layer protects our earth?**

**Ans.** Ozone layer surrounds the globe and protects Earth like a shield from harmful ultraviolet radiation of sunlight as shown in figure otherwise, ultraviolet radiations would cause skin cancer. Thus ozone layer in stratosphere is beneficial for life on Earth.



**Q.20 How the concentration of ozone in stratosphere remains nearly constant?**

**Ans.** Under normal condition ozone concentration in stratosphere remains nearly constant through a series of complex atmospheric reactions. Two reactions that maintain a balance in ozone concentration are as follows:



**Q.21 What is meant by incineration?**

**Ans.** Incineration is a waste treatment process that involves the burning of solid waste at high temperature between 650°C to 1100°C in incinerators.

**Q.22 What is the function of incinerator?**

**Ans.** Incinerators reduce the solid mass of the original waste by 80-85% and convert the waste materials into ash, flue gas and heat. Although, the volume of solid waste is reduced effectively by incineration, it produces highly poisonous gases and toxic ash.

**Q.23. Write composition of flue gas.**

**Ans.** The flue gas includes dioxins, furans, sulphur dioxide, carbon dioxide, carbon monoxide, hydrochloric acid and a large amount of particulate matter.

**Q.24 What is meant by filtration?**

**Ans.** Filtration is separation of insoluble solid particles (sand, clay, dust or precipitates) from a liquid. It is carried out by filtering a mixture.

**Q.25 What is the difference between pollutant and contaminants?**

**Ans.** The pollutants are those substances which cause pollution. While contaminants are those substance that make something impure.

**Q.26. What is meant by air pollution? Write its effects.**

**Ans.** The harmful substances present in air are called air pollutants. Even a beneficial substance beyond a specific concentration may be harmful. Air pollutants change the weather, badly affects the human health, damage the plants and destroy buildings.

**Q.27 What do you mean by atmosphere?**

**Ans** Our planet Earth has four natural systems; lithosphere, hydrosphere, atmosphere, and biosphere. So, atmosphere is the natural system of our planet Earth. It can be defined as Atmosphere is the envelope of different gases around the Earth. It extends continuously from the Earth's surface outwards without any boundary.

**Q.28 What is difference between atmosphere and environment?**

**Ans.**

<b>Atmosphere</b>	<b>Environment</b>
1. Atmosphere is the envelope of different gases around the Earth	1. Environment is the sum of all social, biological, physical and chemical factors which constitutes the surroundings of man.
2. It consists of four layers i.e., troposphere, stratosphere, mesosphere, thermosphere.	2. It consists of air, water, food and sunlight.

**Q.29 Name the major constituents of atmosphere is maintained?**

**Ans.** The major constituents of troposphere are as follows:

- (a) Nitrogen      (b) Oxygen

These two gases comprises 99% by volume of the Earth's atmosphere.

**Q.30 How the temperature of atmosphere is maintained?**

**Ans.** CO<sub>2</sub> and water vapours are present in atmosphere. Yet these are in low concentration but play an important role in maintaining temperature of atmosphere. Because both these gases allow visible light to pass through but absorb infrared radiations emitted by the Earth's surface. So, temperature of atmosphere is maintained.

**Q.31 Where the ozone layer exists?**

**Ans.** Ozone layer exist in mid stratosphere.

**Q.32 Why the temperature of upper stratosphere is higher?**

**Ans.** Because ozone in the upper layer absorbs high, energy ultraviolet radiations from the sun, it raises the temperature of stratosphere. That is the reason temperature of upper stratosphere is higher.

**Q.33 What do you meant by an air pollutant?**

**Ans.** The harmful substances present in air are called air pollutants.

**For example:** Carbon monoxide CO

**Q.34 Name three primary air pollutants.**

**Ans.** (i) Hydrocarbon (CH<sub>4</sub>)      (ii) Ammonia (NH<sub>3</sub>)      (iii) Oxides of nitrogen (NO<sub>x</sub>)

**Q.35 Identify as primary or secondary air pollutant SO<sub>2</sub>, CH<sub>4</sub>, HNO<sub>3</sub>, NH<sub>3</sub>, H<sub>2</sub>SO<sub>4</sub>, O<sub>3</sub>**

**Ans.**

Primary Pollutant	Secondary Pollutant
NH <sub>3</sub>	HNO <sub>3</sub>
CH <sub>4</sub>	H <sub>2</sub> SO <sub>4</sub>
SO <sub>2</sub>	Ozone

**Q.36 Why CO<sub>2</sub> is called a greenhouse gas?**

**Ans.** Carbon dioxide is called as a greenhouse gas because it forms a layer around the Earth like an envelope. It allows the heat rays of the sun to pass through it and reaches upto the Earth but does not allow the IR radiations to pass through. So, it acts like a glass and also called as a greenhouse gas.

**Q.37 Why the flood risks are increasing.**

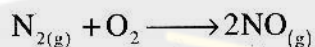
**Ans.** CO is an air pollutant. It is a health hazard being highly poisonous gas. Being colorless and odourless, its presence cannot be noticed easily and readily. When inhaled, it binds with the hemoglobin more strongly than that of oxygen. Thus hindering the supply of oxygen in body. Exposure to higher concentration of CO causes headache and fatigue. If inhaled for a longer time it results in breathing difficulties and ultimately death. It is the reason burning is not allowed in closed places, it is advised to switch off coal or gas heaters, cooking range, etc., before going to sleep.

**Q.38 How sulphur containing compounds are emitted naturally?**

**Ans.** Naturally occurring sulphur containing compounds are emitted in the bacterial decay of organic matter, in volcanic gases and forest fires.

**Q.39 How combustion of fossil fuels in internal combustion engine produces oxides of nitrogen.**

**Ans.** Combustion of fossil fuels in internal combustion engines, in thermal power stations and factories where huge amount of coal is burnt, NO is formed by the direct combination of nitrogen and oxygen.



**Q.40 How acid rain is produced?**

**Ans.** Acid rain means presence of excessive acids in rain water. This rain is produced when normal rain water dissolved oxides of sulphur and nitrogen in air. Rain water converts  $\text{SO}_2$  into  $\text{H}_2\text{SO}_4$  and NO to  $\text{HNO}_2$  and  $\text{HNO}_3$ . These acids reduces the pH of rain water upto 4. Thus acid rain formed on dissolving acidic air pollutant such as  $\text{SO}_2$  and  $\text{NO}_2$  in rain water.

**Q.41 Why acid rain damages buildings?**

**Ans.** Acid rain attacks the calcium carbonate present in the marble and limestone of buildings and monuments. Thus, these buildings are getting dull and eroded day by day.

**Q.42 How aquatic life is affected by acid rain?**

**Ans. Water Pollution:** Acid rain on soil and rocks leaches heavy metals (Al, Hg, Pb, Cr, etc.) with, it and discharges these metals into rivers and lakes. This water is used by human beings for drinking purpose. These metals accumulate in human body to a toxic level. On the other hand, aquatic life present in lakes also suffers because of high concentration of these metals. Especially high concentration of aluminium metal clogs the fish gills. It causes suffocation and ultimately death of fish.

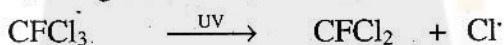
**Q.43 Why plants are dying day**

**Q.45 Why ozone is depleting in atmosphere?**

**Ans. Cause of Depletion of Ozone Layer:**

The ozone layer is being depleted through various chemical reactions, such as:

- (a) The ozone molecule absorbs solar radiations and dissociates readily, i.e., self-dissociation of ozone takes place.
- (b) However, chlorofluorocarbons (CFCs) (under as refrigerants in air conditioners and refrigerators) are major cause of depletion of ozone layer. These compounds leak in one way or other escape and diffuse to stratosphere. These ultraviolet radiations break the C-Cl bond in  $\text{CFCl}_3$  and generates chlorine free radicals as;



These free radicals are very reactive. They react with ozone to form oxygen as



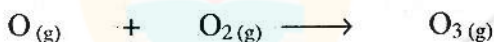
A single chlorine free radical released by the decomposition of CFCs is capable of destroying upto many lacs of ozone molecules. The region in which ozone layer depletes is called ozone hole.

**Q.46 What do you mean by ozone hole?**

Ans. The region in which ozone layer depletes is called ozone hole. A single chlorine free radical released by the decomposition of CFCs is capable of destroying upto many lacs of ozone molecules.

**Q.47 Where the ozone layer is found?**

Ans. Ozone layer lies in stratosphere region and formed by the associates of an oxygen atom with an oxygen molecule in the mid of stratosphere.



**Multiple Choice Questions**

**1. About 99% atmosphere's mass lies within:**

- (a) 30 kilometre
- (b) 35 kilometre
- (c) 15 kilometre
- (d) 11 kilometre

**2. Depending upon temperature variation, atmosphere is divided into how many regions?**

- (a) one
- (b) two
- (c) three
- (d) four

**3. Just above the Earth's surface is**

- (a) mesosphere                      (b) stratosphere  
(c) thermosphere                    (d) troposphere

**4. A group of gases that maintains temperature of atmosphere is**

- (a) carbon dioxide and water vapours  
(b) nitrogen and carbon dioxide  
(c) thermosphere  
(d) troposphere

**5. The Earth's atmosphere is getting hotter because of**

- (a) increasing concentration of CO  
(b) increasing concentration of CO<sub>2</sub>  
(c) increasing concentration of O<sub>3</sub>  
(d) increasing concentration of SO<sub>2</sub>

**6. Which one of the followings is not a greenhouse Effect?**

- (a) increasing atmosphere temperature  
(b) increasing food chains  
(c) increasing flood risks  
(d) increasing sea-level

**7. Normally rain water is weakly acidic because of**

- (a) SO<sub>3</sub> gas                              (b) CO<sub>2</sub> gas  
(c) SO<sub>2</sub> gas                              (d) NO<sub>2</sub> gas

**8. Buildings are being damaged by acid rain because it attacks**

- (a) calcium sulphate  
(b) calcium nitrate  
(c) calcium carbonate  
(d) calcium oxalate

**9. Acid rain affects the aquatic life by clogging fish gills because of:**

- (a) lead metal  
(b) chromium metal  
(c) mercury metal  
(d) aluminium metal

**10. Ozone is beneficial for us as it**

- (a) absorbs infrared radiation  
(b) absorbs ultraviolet radiations  
(c) absorbs chlorofluorocarbons  
(d) absorbs air pollutant

**11. Which one of the following is not an air pollutants?**

- (a) nitrogen  
(b) carbon monoxide  
(c) nitrogen dioxide  
(d) ozone

**12. Iron and steel structure are damaged by**

- (a) carbon monoxide  
(b) sulphur dioxide  
(c) methane  
(d) carbon dioxide

**13. Infrared radiations emitted by the Earth are absorbed by**

- (a) CO<sub>2</sub> and H<sub>2</sub>O  
(b) N<sub>2</sub> and O<sub>2</sub>  
(c) CO<sub>2</sub> and N<sub>2</sub>  
(d) O<sub>2</sub> and CO<sub>2</sub>

**14. Global warming causes rising of the sea level. The cause of global warming is**

- (a) CO<sub>2</sub> gas                              (b) SO<sub>2</sub> gas  
(c) NO<sub>x</sub> gases                            (d) O<sub>3</sub> gases

**15. Which gas protects the Earth's surface from ultraviolet radiations?**

- (a) CO<sub>2</sub>                                      (b) CO  
(c) N<sub>2</sub>                                        (d) O<sub>3</sub>

**16. Effects of ozone depletion are following except the one**

- (a) increases infectious diseases  
(b) increases crops production  
(c) can cause skin cancer  
(d) can cause climatic changes

**17. Which one of these pollutants are not found in car exhaust fumes?**

- (a) CO (b) O<sub>3</sub>  
(c) NO<sub>2</sub> (d) SO<sub>2</sub>

**18. The process by which atmospheric nitrogen is turned into nitrates in the soil is called**

- (a) nitration (b) fixing  
(c) oxidation (d) reduction

**19. Global warming is because of**

- (a) absorption of infrared radiation emitted by earth surface  
(b) absorption of infrared radiations coming from sun.  
(c) absorption of ultraviolet coming from the sun.  
(d) emission of ultraviolet radiation from the earth's surface.

**20. Carbon monoxide is harmful to us because**

- (a) it paralyses the lungs  
(b) it damages lungs tissues  
(c) it reduces oxygen carrying ability of haemoglobin  
(d) it makes the blood coagulate.

**21. Earth has natural systems**

- (a) One (b) two  
(c) Three (d) Four

**22. Atmosphere has regions**

- (a) One (b) two  
(c) Three (d) four

**23. The envelope of different gases around the earth is called**

- (a) Atmosphere (b) biosphere  
(c) Lithosphere (d) hydrosphere

**24. The percentage by volume of nitrogen in dry gas is**

- (a) 78.09% (b) 20.94%  
(c) 0.93% (d) 0.03%

**25. the percentage of sunlight absorbed by atmospheric gases is**

- (a) 2% (b) 10%  
(c) 18% (d) 25%

**26. Atmospheric region found between 50-85 km from the earth is**

- (a) Thermosphere (b) Stratosphere  
(c) Mesosphere (d) Thermosphere

**27. Mesosphere has a temperature range**

- (a) 17<sup>0</sup>C-58<sup>0</sup>C (b) 58<sup>0</sup>C-2<sup>0</sup>C  
(c) 2<sup>0</sup>C-93<sup>0</sup>C (d) -93<sup>0</sup>C

**28. Which gas is the major constituent of troposphere?**

- (a) Nitrogen (b) Oxygen  
(c) Hydrogen (d) both a and b

**29. Which gas is responsible in warming the atmosphere?**

- (a) Nitrogen (b) hydrogen  
(c) Helium (d) Fluorine

**30. At which region all weather occurs?**

- (a) Troposphere (b) Stratosphere  
(c) Mesosphere (d) thermosphere

**31. Almost all air crafts fly in which region?**

- (a) Troposphere (b) stratosphere  
(c) Mesosphere (d) thermosphere

**32. Major portion of ozone layer is found in**

- (a) troposphere (b) Stratosphere  
(c) Mesosphere (d) thermosphere

**33. The region of ozone decomposition in stratosphere is**

- (a) 20km (b) 30 km  
(c) 40 km (d) 50 km

**34. The recombination of O and O<sub>2</sub> in mid stratosphere is an**

- (a) Exothermic reaction
- (b) Endothermic reaction
- (c) heat absorbing process
- (d) None of these

**35. The percentage of SO<sub>2</sub> released by the combustion of coal and petroleum product**

- (a) 40%
- (b) 60%
- (c) 70%
- (d) 80%

**36. Which is not a character of SO<sub>2</sub>**

- (a) It is a colourless gas
- (b) It has irritating smell
- (c) It causes suffocation
- (d) It do not form sulphuric acid

**37. Which gas is produce by the electrical lightening of air**

- (a) NO
- (b) SO<sub>2</sub>
- (c) SO<sub>3</sub>
- (d) CO<sub>2</sub>

**38. Which of the following can be used as a fuel?**

- (a) Methanol
- (b) Ethanol
- (c) bio-diesel
- (d) all of them

**39. The pH of water containing CO<sub>2</sub> is**

- (a) 4-6
- (b) 5.6-6
- (c) 6-7
- (d) 7-8

**40. The PH of acid rain is**

- (a) 2
- (b) 3
- (c) 4
- (d) 5

**41. High concentration of which metal clogs the fish gills.**

- (a) Zinc
- (b) Aluminium
- (c) Sodium
- (d) copper

**42. Ozone is an allotropic form of**

- (a) Carbon
- (b) oxygen
- (c) Sulphur
- (d) Phosphorous

**43. Ultraviolet radiations can causes**

- (a) Hepatitis
- (b) Asthma
- (c) Skin cancer
- (d) Night Blindness

**44. Which gas is in involved in ozone depletion?**

- (a) nitrogen
- (b) CFC's
- (c) chlorine
- (d) all of them

**45. The region in which ozone layer depletes is called**

- (a) Ozone hole
- (b) black hole
- (c) both of them
- (d) None of them

**46. Ozone depletion was first noticed is**

- (a) 1970 s
- (b) 1980 s
- (c) 1990 s
- (d) 1960 s

**47. Which is not an air pollutant?**

- (a) CO<sub>2</sub>
- (b) SO<sub>2</sub>
- (c) CO
- (d) NH<sub>3</sub>

**48. The gas used by plants to perform photosynthesis.**

- (a) O<sub>2</sub>
- (b) CO<sub>2</sub>
- (c) N<sub>2</sub>
- (d) CO

**49. The gas used by animals to perform respiration**

- (a) O<sub>2</sub>
- (b) N<sub>2</sub>
- (c) SO<sub>2</sub>
- (d) Cl<sub>2</sub>

**50. Which is not a poisonous gas?**

- (a) Ozone
- (b) Chlorine
- (c) Carbon dioxide
- (d) all of them

**51. Which gas acts as a glass wall of a green house?**

- (a) Oxygen
- (b) Carbon dioxides
- (c) Sulphur dioxide
- (d) hydrogen

**52. By the increase in the concentration of CO<sub>2</sub> in air,**

- (a) decrease in heat energy
- (b) increase in heat energy

(c) heat energy remains same

(d) None of them

**53. The green house effect is proportional to the amount of which gas in air?**

(a) CO<sub>2</sub>

(b) O<sub>2</sub>

(c) N<sub>2</sub>

(d) All of them

**54. Which is the major effect of global warming?**

(a) Increase in temperature

(b) Rise in sea level

(c) Melting of glaciers

(d) All of them

**55. Higher concentration of CO causes**

(a) fatigue

(b) headache

(c) Both of them

(d) None of them

**56. Catalytic converters convert**

(a) CO to CO<sub>2</sub>

(b) N<sub>2</sub> to NO

(c) CO<sub>2</sub> to CO

(d) N<sub>2</sub> to NO<sub>2</sub>

**57. Which gas is also known as life gas for plants**

(a) CO

(b) O<sub>2</sub>

(c) CO<sub>2</sub>

(d) NO<sub>2</sub>

**58. In the bacterial decay, the compounds of which element are emitted**

(a) Sulphur

(b) Carbon

(c) Nitrogen

(d) All of them

**59. Ozone layer is not found in**

(a) Upper Stratosphere

(b) Mid Stratosphere

(c) Lower Stratosphere

(d) All of them

**60. A pollutant is a waste material that pollutes**

(a) Air

(b) Water

(c) Soil

(d) All of them

**61. Which factor determines the severity of a pollutant?**

(a) Chemical nature (b) concentration

(c) Persistence (d) All of them

**62. Which pollutant is responsible for changing weather?**

(a) Air pollutant (b) Water pollutant

(c) Soil pollutant (d) all of them

**63. Ozone has a smell**

(a) bitter

(b) Rotten egg

(c) Sweat

(d) None of them

**64. Which of the following is a poisonous gas**

(a) oxygen

(b) Ozone

(c) Nitrogen

(d) Carbon dioxide

**65. The waste products driven out because of the combustion of fossil fuels**

(a) Primary pollutant

(b) Secondary pollutant

(c) Tertiary Pollutant

(d) None of them

**66. The smell of photocopier machine is due to the presence of**

(a) Chlorine gas

(b) neon gas

(c) helium gas

(d) ozone gas

**67. PAN stands for**

(a) Poly aniline nitrate

(b) peroxy acetyl nitrate

(c) poly acetyl nitrite

(d) Peroxy acetyl nitrite

**68. Which of the following is a secondary pollutant**

(a) CO<sub>2</sub>

(b) CO

(c) SO<sub>3</sub>

(d) HF

**69. 99% of atmosphere consists of**

(a) N<sub>2</sub> and H<sub>2</sub>

(b) N<sub>2</sub> and O<sub>2</sub>

(c) N<sub>2</sub> and CO<sub>2</sub>

(d) O<sub>2</sub> and CO<sub>2</sub>

**70. Which gas is emitted due to volcanic eruption?**

(a) CO<sub>2</sub>

(b) SO<sub>2</sub>

(c) NO<sub>2</sub>

(d) H<sub>2</sub>

**71. Fossil fuel means**

(a) Coal

(b) Petroleum

(c) Natural gas

(d) All of them

**72. Forest fires and burning of wood emit**

(a) CO<sub>2</sub>

(b) NO<sub>2</sub>

(c) SO<sub>2</sub>

(d) Cl<sub>2</sub>

**73. The range of temperature in burning solid waste burning in incinerators is**

(a) 650<sup>0</sup>-1000<sup>0</sup>C (b) 650<sup>0</sup>C to 1100<sup>0</sup>C

(c) 1000<sup>0</sup>-2000<sup>0</sup>C (d) 5000C to 1000<sup>0</sup>C

**74. Incinerator reduces solid waste into**

(a) Ash

(b) flue gas

(c) heat

(d) all of them

**75. Which is not a part of flue gas?**

(a) Furans

(b) Dioxins

(c) HCl

(d) H<sub>2</sub>SO<sub>4</sub>

**76. Thermosphere lies beyond**

(a) Stratosphere

(b) Troposphere

(c) Mesosphere

(d) Biosphere

**77. The solid particle deposit on the filter paper during filtration is called**

(a) Precipitates

(b) Residue

(c) Crystals

(d) All of them

### Answer Key

1	a	2	d	3	d	4	a	5	b
6	b	7	b	8	c	9	d	10	b
11	d	12	b	13	d	14	a	15	d
16	b	17	b	18	a	19	c	20	c
21	d	22	d	23	a	24	a	25	c
26	c	27	c	28	d	29	a	30	a
31	a	32	b	33	c	34	a	35	d
36	d	37	a	38	d	39	b	40	c
41	b	42	b	43	c	44	b	45	a
46	b	47	a	48	b	49	a	50	c
51	b	52	b	53	a	54	d	55	c
56	a	57	c	58	a	59	c	60	d
61	d	62	a	63	a	64	b	65	a
66	d	67	b	68	d	69	b	70	a
71	d	72	a	73	b	74	d	75	d
76	c	77	b						