Greenhouse Effect, Ozone Depletion & Deforestation

1 Mark Questions

1.Why is Gambusia introduced into drains and ponds? [All India 2014]

Ans. Gambusia is introduced into drains and ponds to control breeding and propagation of mosquitoes as they feed on mosquito larva. Thus, controls mosquito population.

2.Name the greenhouse gases that contribute to global warming. [Delhi 2014]

Ans. The greenhouse gases that contribute to global warming are $C0_2$, CH_4, N_20 and CFCs.

3. State the purpose of signing the Montreal Protocol. [Foreign 2014]

Ans. The purpose of signing the Montreal Protocol is to control the emission of ozone depleting substances.

4. Where is good ozone present? Why is it called SO? [All India 2014C]

Ans. Good ozone is present in stratosphere, the upper part of atmosphere.

It is called 'good ozone' because it acts as a shield absorbing ultraviolet radiations from sun.

5. Name the two gases contributing maximum to the greenhouse effect. [Delhi 2014C]

Ans. The two gases contributing maximum to greenhouse effect are $C0_2$ and CH_4.

6. Write the unit used for measuring ozone thickness. [Delhi 2011]

Ans. Dobson Unit (DU) is used for measuring ozone thickness.

7. How does jhum cultivation promotes deforestation? [All India 2011c]

Ans. In jhum cultivation, the farmers cut down the trees of forest and burn the plant remains. The ash is used as fertiliser and land is used for farming. After cultivation the area is left free for several years for recovery. The recovery phase is often ignored leading to deforestation.

8. How is snow blindness caused in humans? [All India 2010]

Ans. Snow blindness is caused by absorption of UV-B radiation.

9. Name two greenhouse gases produced by anaerobic microbes. [Foreign 2010]

Ans. Carbon dioxide and methane are the green house gases produced by anaerobic microbes.

10. Mention the causes of thinning of ozone layer. [Delhi 2010c]

Ans. CFCs release chlorine atoms, when UV-rays act on them. Chlorine degrades the ozone into molecular oxygen. Thus, causing thinning of ozone layer.

2 Marks Questions

11. Write, what was the percentage of forest cover of India at the beginning and at the end of twentieth century? How different is it from the one recommended by National Forest Policy? [Foreign 2014]

Ans. In the beginning of the twentieth century, the forest cover was about 30% while towards its end is reduced to only 19.4%. The National Forest Policy of India recommends approximately 60% forest cover for hilly regions including Himalayas, while 33% for plains. However, the situation is contrastingly different as the production of forests in India is very slow.

12. (i) State the cause of depletion of ozone layer.

(ii) Specify any two ill effects that it can cause in the human body. [Foreign 2014]

Ans. (i) The main cause of depletion of ozone layer is due to imbalance between production and degradation of ozone in the stratosphere. This balance is disrupted mainly due to increase in ozone degradation by GFCs.

(ii) The two ill-effects that ozone depletion can cause in human body are:

- Allows UV-B radiation to enter atmosphere that increases mutation and damages DNA.
- Causes ageing of skin and damage to skin cells and cancer.
- Inflammation of cornea (snow blindness), cataract, etc.

13. Refrigerants are considered to be a necessity in modem living, but are said to be responsible for ozone holes detected in Antarctica. Justify. [Foreign 2012]

or

Chlorofluorocarbons (CFCs) are widely used as refrigerants. Then why it is suggested to reduce its emission as far as possible? Explain. [Delhi 2010]

Ans. (i) Refrigerants contain CFCs which are released in lower part of the atmosphere. (/) They move upward and reach the stratosphere.

(ii) In stratosphere, UV-rays act on them releasing Cl atoms. Cl degrade ozone and releases molecular oxygen.

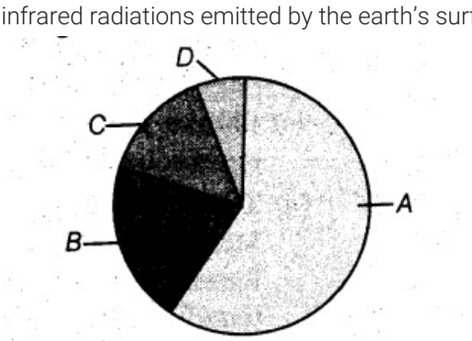
(iii) Cl atoms act only as catalysts, the CFCs have a permanent damaging effect on ozone.

14. The figure given below shows the relative contribution of four greenhouse gases to global warming

- **Identify the gases A and G.**
- **Why are these four gases called greenhouse gases? [Foreign 2011]**

Ans. (i) A- Carbon dioxide ($C0_2$) C – Chlorofluorocarbons CFCs.

(ii) These for gases ($C0_2$, CH_4, N_20 and CFCs) are called greenhouse gases, as they absorb infrared radiations emitted by the earth's surface.



15. (i) Name the greenhouse gases that caused global warming.

(ii) Which of them has caused ozone hole and how? [Foreign 2008]

Ans. Greenhouse gases that caused global warming, i.e. carbon dioxide, methane, Chlorofluorocarbons (CFCs) and nitrous oxide.

(ii) CFCs cause ozone hole. These are degraded in the stratosphere in the presence of UV-radiation, releasing Cl atom. Cl atoms act as catalyst in the degradation of ozone releasing molecular oxygen. Since, all Cl atoms are not used up in the reaction, they continue to affect the ozone.

16. How does global warming pose a threat to the coastal areas of the earth? Explain. [All India 2008C]

Ans. Rise in global temperature is causing deleterious changes in the environment resulting in odd climatic changes (El Nino effect). It leads to melting of ice caps as well as of Himalayan snow caps. Over many years, this will result in a rise in sea leve! that may submerge many coastal areas. Hence, it is a threat to coastal areas

3 Marks Questions

17. How do human activities cause desertification? [Delhi 2009c]

Ans. The human activities like over-cultivation, unrestricted grazing, poor irrigation practices, results in arid patches of land (deforestation). When these large barren patches extend and remain unattended for long, a desert is created. Because the formation of fertile top layer of soil takes millions of years, desertification easily takes over.

18. Explain greenhouse effect and depletion of ozone layer with reference to global warming. [All India 2009C]

Ans. Greenhouse effect is the phenomenon responsible for heating of the earth due to the presence of certain gases in the atmosphere. Greenhouse gases ($C0_2$ CH_4 N_20 and CFCs) allow the solar radiations to enter, but prevent the escape of heat radiations of longer wavelength. When these greenhouse gases increases4n concentration in the atmosphere, global warming occurs .

Depletion of ozone layer occur due to increased level of CFCs. CFCs react with UV-rays in stratosphere to release chlorine atoms. Cl degrades ozone and releases molecular oxygen. CFCs have permanent and continuous effect as Cl atoms are not consumed. This leads to thinning of ozone layer. As a result, harmful radiations enter the earth's atmosphere, which causes rise in temperature and thus, global warming results.

19. How is ozone formed in the stratosphere? Why is it called good ozone? Explain CFCs contribute to ozone hole formation. [All India 2009c]

Ans. Formation of ozone in stratosphere

(i) Nascent oxygen combines with molecular oxygen (0_2) to form ozone by the action of UV-rays.

$$\underset{\text{Molecular oxygen}}{O_2} \xrightarrow{\text{UV-rays}} [O] + \underset{\text{Nascent oxygen}}{[O]}$$

$$O_2 + [O] \xrightarrow{\text{UV-rays}} \underset{\text{Ozone}}{O_3} \qquad \textbf{(1)}$$

It is called good ozone as it absorbs harmful UV radiations from the sun.

CFCs react with UV in stratosphere to release Cl atoms. Cl atoms act as catalyst to degrade ozone and release molecular oxygen. CFCs have permanent and continuous effect as Cl atoms are not consumed. This leads to thinning of ozone layer. It has resulted in the formation of ozone hole as observed over the Antarctica region.

20. It has been recorded that the temperature of the earth's atmosphere has increased by 0.6°C.

(i) What has caused this increase? (ii) Explain its consequences. [Delhi 2008]

Ans. Increase in the level of greenhouse gases ($C0_2$ CFCs, etc.) in the atmosphere allow the heat waves to reach earth but prevent their escape and thus, the earth becomes warm.

(ii) Effects of increased temperature

- It leads to deleterious changes in environment resulting into odd climatic changes called El Nino effect.
- It results into increased melting of polar ice caps which will cause the rise in sea level and many coastal areas also be submerged.
- It leads to increased weed growth, eruption of diseases and pests. Thus, the crop productivity also decreases.

5 Marks Questions

21. Why is the ozone layer required in the stratosphere? How does it get degraded? Explain.

(ii) Why is the ozone depletion a threat to mankind? [Delhi 2013c]

Ans. Ozone found in stratosphere is required because it acts as a shield absorbing harmful ultraviolet radiations coming from the sun. (I)' Ozone layer gets depleted by the ozone depleting compounds mainly Chlorofluorocarbons (CFCs), which travel to the stratosphere after being released from the refrigerants and industrial emissions. UV rays from the sun acts on CFCs releasing atoms which degrade ozone releasing molecular oxygen.

(ii) Ozone depletion is proved to be a threat to mankind in following ways

- Causes damage to human skin cells.
- Causes mutation and induce breaks in chemical bonds of DNA molecules.

22. (i) Expand CFG.

(ii) CFGs are a part of greenhouse gases. Name the other gases.

(iii) Explain the major harms caused by these gases.

(iv) Mention the consequences of the degradation of O_3 . [All India 2009C]

Ans. (i) Chlorofluorocarbon.

(ii) $C0_2$, CH_4, $N_2O$are other greenhouse gases.

(iii) These gases absorb radiations, that comes to earth's surface and heat it. This cycle is repeated many times, heating the earth.

(iv) Ozone depletion is proved to be a threat to mankind in following ways

- Causes damage to human skin cells.
- Causes mutation and induce breaks in chemical bonds of DNA molecules.