CBSE Test Paper 04

Chapter 14 Natural Resources

1. Statement A: 1% reduction of ozone in ozonosphere allows 2% more high energy ultraviolet radiations to reach earth
   Statement B: Endoskeleton and exoskeleton of various animals are formed by sulphate salts.
   Which statement among the two statement is true? **(1)**

   a. Statement A
   b. Both a and b
   c. None of these
   d. Statement B

2. The difference between an oxygen molecules and an ozone molecule is that: **(1)**

   a. Oxygen molecule has two atoms of oxygen and ozone molecule has three atoms of oxygen.
   b. Oxygen molecule has one atom of oxygen and ozone molecule has three atoms of oxygen.
   c. Oxygen molecule has three atoms of oxygen whereas ozone molecule has two atoms of oxygen.
   d. Oxygen molecule has two atoms of oxygen and ozone molecule has one atom of oxygen.

3. Water pollution is **(1)**
   A. Addition of undesirable substances into water bodies
   B. Removal of desirable substances from water
   C. Change of temperature
   D. Addition of desirable substance into water

   a. (a), (b) and (c) are correct
   b. (a) and (b) are correct
   c. (b) and (c) are correct
   d. (a), (b), (c) and (d) are correct

4. Global warming has resulted due to **(1)**

    a. lack of rainfall worldwide
    b. increased emissions of fine particulates from automobiles
    c. oxides of sulphur and nitrogen
    d. increases emissions of CO_2 from automobiles

5. Atmosphere maintain the temperature of earth because **(1)**

    a. It hold air, which is bad conductor of heat
    b. It contains water vapor
    c. It reflects the heat rays
    d. It absorbs the heat rays

6. What are the different states in which water is found during the water cycle? **(1)**

7. What are biogeochemicals? **(1)**

8. What is thermal pollution? **(1)**

9. What is greenhouse effect? Name a green house gas? **(1)**

10. What does the presence of smog in an area indicate? **(1)**

11. What is biological nitrogen fixation? Name the organisms responsible for it. **(3)**

12. What is the greenhouse effect? **(3)**

13. All the living organisms are basically made up of C, N, S, P, H and O. How do they enter the living forms? Discuss. **(3)**

14. A motor car, with its glass totally closed, is parked directly under the Sun. The inside temperature of the car rises very high. Explain why? **(5)**

15. Draw nitrogen cycle? Explain the different steps. **(5)**

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Answers

1. a. Statement A

   Explanation: One percent reduction of ozone in ozonosphere allows 2% higher energy ultraviolet radiations to reach earth. UV radiations cause skin disease to human beings. Endoskeleton and exoskeleton of animals are formed by calcium and magnesium salts.

2. a. Oxygen molecule has two atoms of oxygen and ozone molecule has three atoms of oxygen.

   Explanation: The only difference is that ozone is made up of three oxygen atoms, while the stuff we breathe (molecular oxygen) is made up of only two atoms. Solar rays high in the atmosphere convert O_2 to O_3. In the upper atmosphere, rays from the Sun break a normal oxygen molecule into two separate oxygen atoms.

3. a. (a), (b) and (c) are correct

   Explanation: The term water-pollution is used to cover the following effects:

   - **The addition of undesirable substances to water-bodies:** The fertilizers and pesticides used in farming or any poisonous substances, like mercury salts which are used by paper-industries are water pollutants. These could also be disease-causing organisms, like the bacteria which cause cholera.
   - **The removal of desirable substances from water-bodies:** Live animals and plants present in water uses dissolved oxygen. Any change that reduces the amount of dissolved oxygen would adversely affect these aquatic organisms. Other nutrients could also deplete from the water bodies.
   - **A change in temperature:** The eggs and larvae of various aquatic animals are susceptible to temperature changes. The aquatic organisms are used to a certain range of temperature in the water bodies where they live, and a sudden marked change in this temperature would be

dangerous for them or affect their breeding.

So, (a), (b) and (c) are correct.

4. d. increases emissions of CO_2 from automobiles

   Explanation: Global warming is caused by the emission of greenhouse gases. 72% of the totally emitted greenhouse gases is carbon dioxide (CO_2), 18% Methane and 9% Nitrous oxide (NOx). Carbon dioxide emissions therefore are the most important cause of global warming. CO_2 is inevitably created by burning fuels like e.g. oil, natural gas, diesel, organic-diesel, petrol, organic-petrol, ethanol.

5. a. It hold air, which is bad conductor of heat
   Explanation: It hold air, which is bad conductor of heat

6. Water occurs in all three states of matter during the water cycle:

   Solid, ice, liquid: water, gas: water vapour

7. Biogeochemicals are essential elements or nutrients required by living organisms which are obtained from earth.

8. Thermal pollution is raising temperature of water due to addition of hot effluents into it.

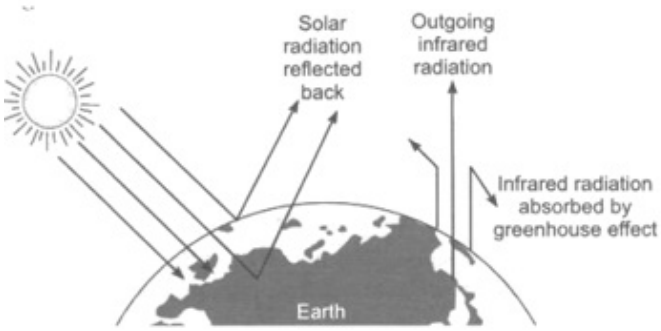
9. Increase in earth's temperature due to increased CO2 concentration in atmosphere, this phenomenon is known as green house effect.
   Carbon dioxide is one of the green house gasses.

10. The presence of smog in an area indicates the high percentage of smoke released in the air by combustion of fossil fuel in industries, thermal power plants or automobiles. It is an indicator of air by the process of combustion.

11. Biological nitrogen fixation means the conversion of atmospheric nitrogen into useful nitrogen compounds by bacteria and algae. The bacteria present in the root nodules of leguminous plants like Rhizobium as well as some blue green algae help in the fixation of atmospheric nitrogen.

12. A part of the sunlight that falls on the Earth is reflected back in the form of infrared

light. This infrared light is absorbed by the carbon dioxide molecules present in the atmosphere. Due to increasing industrialisation, the combustion of fossil fuels and deforestation the concentration of carbon dioxide in the atmosphere also increase. Air containing more CO_2 would be able to trap a larger amount of the infrared light thereby heating the atmosphere. This heating of the atmosphere due to the absorption of infrared radiations by CO_2 molecules called the greenhouse effect.



13. Plants take up C and H by the process of photosynthesis and the rest of the minerals are absorbed from the soil. Consumers take in O by the process of respiration and the rest of the minerals are taken via food.

14. Infrared radiations in sunlight pass through the glass and heat the interior of the car. The radiation emitted by upholstery and other inner parts of the car cannot pass out of the glass, so the heat trapped inside raises the temperature of the interior. This is because glass is transparent to infrared radiation from the Sun having smaller wavelengths than that emitted by the interior of the car which are of longer wavelengths to which the glass is opaque.

15. Steps of the Nitrogen cycle

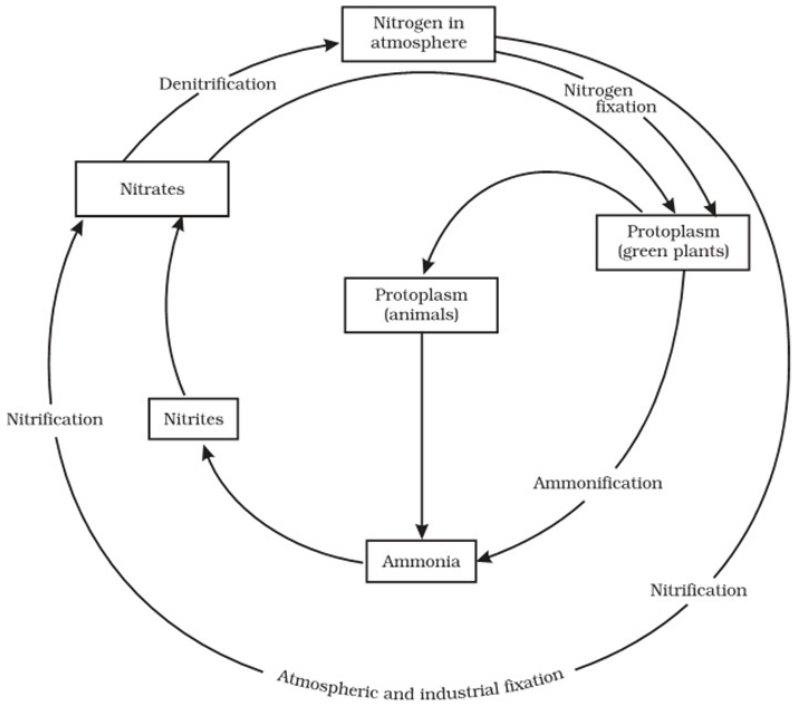
    i. Ammonification – The process of conversion of complex organic compounds like proteins into ammonia (NH_3) is called ammonification.

    ii. Nitrification – The process of conversion of ammonia into nitrites and nitrates is called nitrification. It occurs in two-steps

        a. Ammonia $\xrightarrow[\text{Nitrosomonas(Bacteria)}]{}$ Nitrate

        b. Nitrite $\xrightarrow[\text{Nitrobacter}]{}$ Nitrate

    iii. Denitrification – The process of conversion of nitrate salts in the soil and water to free nitrogen gas. This is done by bacteria pseudomonas.


Nitrogen in atmosphere
Denitrification
Nitrogen fixation
Nitrates
Protoplasm (green plants)
Protoplasm (animals)
Nitrification
Nitrites
Ammonification
Ammonia
Nitrification
Atmospheric and industrial fixation