HOTS (Higher Order Thinking Skills)

Q. 1. If there is no atmosphere around the Earth, what will happen to its temperature?

Ans. The atmosphere around the Earth prevents the heat radiation to escape into the outer space. So, in the absence of the atmosphere, the temperature of Earth will decrease up to freezing point during night and increase during day because atmosphere is no longer there to absorb radiations. Thus, it maintains fairly uniform temperature during the day and night.

Q. 2. What would happen if all the oxygen present in the environment is converted to ozone?

Ans. Ozone is a poisonous gas and is thus only present in a thin layer in the stratosphere. If all the oxygen is converted to ozone, the environment will become poisonous and will lead to killing of all living forms.

Q. 3. When we breathe in air, nitrogen also goes inside along with oxygen. What is the fate of this nitrogen?

Ans. The nitrogen inhaled during respiration is not used in the body and it comes out with CO_2 during exhalation.

Q. 4. Why does moon have very cold and very hot temperature variations, e.g., from 190°C to110°C, even though it is at the same distance from the Sun as the Earth is?

Ans. Absence of atmosphere on the moon has resulted in varying temperature on its surface. The temperature on Earth is maintained by the atmospheric layer around the Earth. It absorbs radiation avoiding overheating and prevents loss of heat from the surface preventing Earth's cooling.

Q. 5. Why is the air near the busy roads more polluted than air at a distance from the busy roads?

Ans. Burning of gasoline to power cars and trucks gives out particulate carbon, carbon dioxide, carbon monoxide, hydrocarbons, oxides of nitrogen and sulphur. Emissions released directly into the atmosphere from the vehicles remain confined in the congested areas near busy roads.

Q. 6. Large amount of carbon dioxide is produced during cellular respiration, burning of fossil fuels and forest fires. Still the concentration of carbon dioxide in Earth's atmosphere is only 0.03%. On the planets Venus and Mars, it constitutes 95-97% of the atmosphere. Give reason for this difference.

Ans. Earth's atmosphere has less carbon dioxide because:

(a) Green plants fix carbon dioxide during photosynthesis.
(b) Most marine animals use carbonates dissolved in sea water and make their shells.

Q. 7. 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.

Ans. 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.

Q. 8. Why do people love to fly kites near the seashore?

Ans. Due to the uneven heating of land and sea, there is movement of air leading to wind formation near seashore. Because of the wind created during day time people fly kites near seashore.

Q. 9. Why does Mathura refinery pose problems to the Taj Mahal?

Ans. Mathura refinery releases toxic gases (like oxides of sulphur) which results in acid rain. Due to this there is discolouring and corrosion of the marbles of Taj Mahal.

Q. 10. Why do not lichens occur in Delhi whereas they commonly grow in Manali or Darjeeling?

Ans. Lichen is a bio-indicator and sensitive to SO_2 pollution from automobiles. Delhi has maximum automobile pollution, hence has a highly polluted environment. Due to the polluted environment, lichen do not survive in Delhi whereas they are present in the pollution-free environment of Darjeeling or Manali.

Q. 11. During summer, if you go near the lake, you feel relief from the heat, why?

Ans. During summer, due to the high temperature there is evaporation of the water. This results in a comparative lower temperature on water surface and thus the air near the water bodies is cooler.