

NATURAL RESOURCES

QUESTION BANK

Very Short Answer Questions

Question 1.

What are renewable resources?

Answer:

Resources which can replenish themselves by quick recycling are called renewable resources. For example, forests and wildlife.

Question 2.

What are the two main causes of over-exploitation of natural resources?

Answer:

Growing population and industrialisation.

Question 3.

Name the component of air that has maximum solubility in water.

Answer:

Carbon dioxide

Question 4.

In which zone of atmosphere is ozone layer present?

Answer:

Stratosphere

Question 5.

Which gas is added to the atmosphere by the decay of organic matter?

Answer:

Carbon dioxide

Question 6.

Name the two things essential for existence of life on Earth.

Answer:

- Natural resources like air, land and water.
- Energy of the Sun.

Question 7.

Name the processes which help to maintain the balance between oxygen and carbon dioxide in the environment.

Answer:

Photosynthesis and respiration.

Question 8.

What are the two forms of elemental oxygen found in the atmosphere?

Answer:

Molecular oxygen and ozone.

Question 9.

Which group of organisms is poisoned by elemental oxygen?

Answer:

Anaerobic bacteria

Question 10.

What is the effect of oxygen on nitrogen fixation?

Answer:

Nitrogen fixation cannot take place in the presence of oxygen.

Question 11.

What are the basic requirements for existence of life?

Answer:

Food, water, air and optimum temperature.

Question 12.

How is humus a major factor in deciding the soil structure?

Answer:

Humus makes the soil more porous and allows the water and air to penetrate deep in soil.

Question 13.

What are clouds?

Answer:

Clouds are collection of tiny particles of liquid or solid water occurring in the atmosphere above the Earth's surface.

Question 14.

Name any one source of freshwater.

Answer:

Rainwater

Question 15.

From where do we procure table salt?

Answer:

From sea water

Question 16.

Give any two uses of groundwater.

Answer:

It is used for human consumption and irrigation purposes.

Question 17.

Why step farming is common in hills?

Answer:

Step farming is practised in hills to check soil erosion through water currents on the slopes.

Question 18.

What is topsoil?

Answer:

The topmost layer of the soil which contains soil particles, humus, as well as living organisms is called topsoil.

Question 19.

What do you mean by fertility of the soil?

Answer:

Fertility is the capacity of the soil to sustain plant life with the required nutrients.

Question 20.

What are biodegradable pollutants?

Answer:

They are the pollutants that degrade by natural means. For example, paper, excreta of animals, etc.

Question 21.

Name the organisms that help in bringing back the minerals from the living system to the nutrient pool.

Answer:

Decomposers

Question 22.

Which group of plants has nitrogen-fixing bacteria in the root nodules?

Answer:

Leguminous plants

Question 23.

Name the organism found in the root nodules of leguminous plants.

Answer:

Rhizobium bacteria.

Question 24.

What are CFCs?

Answer:

CFCs or chlorofluorocarbons are man-made organo-halogens used in refrigerators that degrade the ozone layer.

Question 25.

The atmosphere of the Earth is heated by which radiations?

Answer:

Through long wave radiations re-radiated by land and water.

Question 26.

How are the nitrogen molecules present in air converted into nitrates and nitrites?

Answer:

By the biological process of nitrogen fixing bacteria present in soil.

Question 27.

What is 'ozone hole'?

Answer:

The thinning of ozone layer at few places is called the ozone hole.

Question 28.

What is the major source of mineral in soil?

Answer:

The parent rock from which soil is formed.

Question 29.

What does marked temperature changes in aquatic environment mainly affect?

Answer:

Breeding of aquatic animals.

Short Answer Questions-I

Question 1.

What are the harmful effects of ozone?

Answer:

Inhaling ozone causes dryness of mucous membrane of the mouth, nose and throat; it changes visual activity; causes headache and pulmonary congestion. It even harms leafy vegetables, field crops, fruits and forest trees.

Question 2.

There is mass mortality of fishes in a pond. What may be the reasons?

Answer:

- Addition of hot water.
- Addition of poisonous (mercury) compounds in water. (in) Blockage of gills of fishes with any pollutant.

Question 3.

Write the major uses of oxygen.

Answer:

The major uses of oxygen are:

- It is necessary for respiration in the living beings.

- Oxygen is essential for combustion, i.e., burning.

Question 4.

How is carbon dioxide fixed?

Answer:

- Green plants convert CO₂ into glucose in the presence of sunlight by the process of photosynthesis.
- Many marine animals use carbonates dissolved in sea water to make their cells.

Question 5.

All the living organisms are basically made up of C, N, S, P, H and O. How do they enter the living forms? Discuss. [NCERT Exemplar]

Answer:

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 and H by the process of respiration and the rest of the minerals are taken via food.

Question 6.

Why does the percentage of gases like oxygen, nitrogen and carbon dioxide remain almost the same in the atmosphere? [NCERT Exemplar]

Answer:

Cycling of these gases maintains consistency of these gases. These are taken up and released by almost every living organism and thus their concentration in the atmosphere is maintained.

Question 7.

Justify "Dust is a pollutant". [NCERT Exemplar]

Answer:

Dust is present in air as suspended particles. It can cause allergy and other respiratory diseases. It also affects plant growth by covering stomata on leaf surface and blocking them. It acts as the carrier of toxic compounds like heavy metals. Thus, dust acts as a pollutant.

Question 8.

What causes acid rain?

Answer:

The burning of fossil fuels like coal and petroleum produces oxides of nitrogen and sulphur which reach the atmosphere. When they dissolve in rain, they form nitric acid and sulphuric acid and fall as acid rain.

Question 9.

What is smog?

Answer:

The suspended particles like unburnt carbon particles and hydrocarbons mix with smoke and fog in the atmosphere, especially in the cold weather to form smog which results in a lowered visibility.

Question 10.

How is ozone layer useful to us?

Answer:

Ozone is present in the upper layers of the atmosphere (stratosphere). Before reaching the Earth, the sunrays pass through the stratosphere. The ozone layer present there absorbs the harmful UV rays present in the sunrays and prevent them from reaching the Earth. Thus, it protects the entire planet from disastrous effects of UV rays.

Question 11.

Why is it said that nitrogen is very important for us?

Answer:

Nitrogen is the most abundant gas in our atmosphere. In fact it makes up 78% of our atmosphere and is also a part of many molecules essential to life like proteins, nucleic acids (DNA and RNA) and some vitamins. Moreover, it is found in other biologically important compounds such as alkaloids and urea. Thus, nitrogen is very important for us.

Question 12.

How is a balance maintained in the environment?

Answer:

The living or biotic components (plants and animals) and the non-living or physical components (air, water, soil, light and temperature) interact and affect each other, resulting in the establishment of a complex and complete balance in the environment. There is a continuous cycle of nutrients among the biotic and abiotic components.

Question 13.

What are the two main sources of air pollution?

Answer:

- Fixed sources: These are fixed or located at specific sites, like industrial units, electric power plants, etc.
- Mobile sources: These include the vehicles and different modes of transport using fossil fuels.

Question 14.

Write the major uses of water.

Answer:

Water is used

- for drinking and cooking,
- for bathing and washing clothes,
- for irrigation, and
- in industries.

Question 15.

Why does water need conservation even though large oceans surround the land

masses? [NCERT Exemplar]

Answer:

Marine water is not useful for human and plant life directly due to high salt content. Uneven distribution of limited freshwater resources need conservation to cater to the demands.

Question 16.

What are aerosols?

Answer:

They are certain chemicals like fluorocarbons, released in the air either naturally or by human activities in the form of mist or vapour. Fluorocarbons, which deplete the ozone layer on the atmosphere, are emitted by jet aeroplanes in the form of aerosols.

Question 17.

What are the factors determining the soil type?

Answer:

The soil type depends on the following factors:

- Size of the soil particles.
- Amount of humus.
- Microorganisms present in the soil.

Question 18.

What makes the biosphere dynamic but stable system?

Answer:

A constant interaction between biotic and abiotic components of biosphere makes it dynamic and stable.

Interaction consists of transfer of matter and energy between different components of biosphere.

Question 19.

Explain the role of the Sun in the formation of soil. [NCERT Exemplar]

Answer:

During the daytime, the rocks are heated up by the Sun and thus they expand. Whereas, at night they cool down and thus contract. Since all parts of the rock do not expand and contract at the same rate, it results in cracking of rocks, breaking them into smaller pieces.

Question 20.

How do fossil fuels cause air pollution? [NCERT Exemplar]

Answer:

The combustion of fossil fuels like coal, petroleum, etc., not only produces energy but also produces oxides of nitrogen and sulphur like carbon monoxide, sulphur dioxide, oxides of nitrogen as well as smoke particles. These gases accumulate in the atmosphere and leads to inhalation problems, acid rains, and increase in the amount of suspended particles in the air.

Question 21.

What would happen if the Sun heated the Earth's surface equally everywhere?

Answer:

If the Sun heated the Earth's surface equally there would be no pressure difference and thus no movement of air. This would ultimately result in an increased surface temperature.

Question 22.

What do you mean by biological nitrogen fixation?

Answer:

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.

Question 23.

The flow of energy is unidirectional whereas the biogeochemical transfer is cyclic.

Why is it so?

Answer:

A large amount of energy is always lost into the atmosphere during its transfer from one level to another. This lost energy cannot be replenished from the atmosphere. Thus, the energy flow is unidirectional. On the other hand, the biogeochemical substances are never lost in the biogeochemical cycle. They are only recycled.

Question 24.

Justify the statement 'The nitrogen cycle is supposed to be an ideal cycle in the biosphere'.

Answer:

The nitrogen cycle is said to be an ideal cycle in the biosphere because the amount of nitrogen remains constant throughout the entire cycle and no nitrogen is lost. Hence, it follows the law of conservation of matter. In the other cycles of biosphere there is either loss of energy or loss of matter.

Question 25.

Why are oceans salty?

Answer:

As water flows through rivers, it dissolves small amounts of mineral salts from the rocks and soil of the river beds. This very salty water flows into the oceans and seas. Continuous evaporation of water from the oceans and seas (and freezing of polar ice) results in the increased concentration of minerals in sea water. Thus, the remaining water gets rather saltier as time passes.

Question 26.

Carbon dioxide is necessary for plants. Why do we consider it as a pollutant?

[NCERT Exemplar]

Answer:

Plants require CO_2 in an optimum amount for the process of photosynthesis. But, high concentration of (more than normal) CO_2 is harmful and considered as a

pollutant. Higher concentration of CO_2 is one of the causes of greenhouse effect and global warming as it absorbs the infrared radiations thus increasing the temperature of Earth. This leads to many environmental problems.

Question 27.

Rivers from land add minerals to sea water. Discuss how. [NCERT Exemplar]

Answer:

Water is capable of dissolving a large number of substances. As water flows over the rocks containing soluble minerals, some of them get dissolved in the water. Thus, rivers carry many nutrients from land to the sea.

Question 28.

Following are a few organisms

- (a) lichen
- (b) mosses
- (c) mango tree
- (d) cactus

Which among the above can grow on stones and also help in formation of soil? Write the mode of their action for making soil. [NCERT Exemplar]

Answer:

Lichens and mosses grow on rocks. Lichens and mosses release chemical substances which break down the stones resulting in the formation of soil.

Short Answer Questions-II

Question 1.

Why does life not exist on Venus and Mars while it exists on Earth?

Answer:

The major component of the atmosphere on Venus and Mars is carbon dioxide. In fact, CO_2 constitutes up to 95-97% of the atmosphere on these planets. So, no life is known to exist on these planets as O_2 is necessary for maintaining life. On the other hand, the atmosphere on Earth has life supporting gases like nitrogen, oxygen, CO_2 and water vapour. Apart from that, water is also present only on Earth.

Question 2.

Why is carbon dioxide produced in large extents?

Answer:

We all need oxygen to break down glucose molecules and get energy for all our activities. During glucose breakdown, carbon dioxide is released. Moreover, a lot of carbon dioxide is produced during combustion of various industrial and other human activities. Forest fires also produce a lot of carbon dioxide. Combustion in vehicles contribute a large amount of carbon dioxide to the atmosphere.

Question 3.

In coastal area, wind current moves from the sea towards the land during day but during night it moves from land to the sea. Discuss the reason. [NCERT Exemplar]

Answer:

Air moves from a region of high pressure to a region of low pressure. Air above the

land gets heated quickly during day and starts rising. This creates a region of low pressure as a result of which air above the sea rushes into this area of low pressure. This movement of air from one region to other creates winds. During night, as water cools down slowly, the air above water is warmer than the air on land. So, air moves from land to sea creating winds.

Question 4.

Name the major industrial air pollutants.

Answer:

The major industrial air pollutants are:

- SO₂, CO₂, oxides of nitrogen
- H₂
- Fumes of acids
- Dust
- Particles of unburnt hydrocarbons
- Lead
- Asbestos
- Cement

Question 5.

Name the properties of potable drinking water.

Answer:

- It should be clear and colourless.
- It must not be foul-smelling.
- It must have sufficient amount of oxygen dissolved in it.
- It should be free from harmful microorganisms.
- It must also be free from various chemical pollutants that are injurious to our health.

Question 6.

What methods should be employed for conserving water resources?

Answer:

- Careful and economical use of water.
- Artificial recharging of groundwater.
- Dams should be built for storage of flood water.
- Rainwater harvesting.

Question 7.

How can the water released from dams affect the aquatic life?

Answer:

Like all lifeforms, aquatic organisms also survive within a certain temperature range only. The water in the deep reaches of the dams is cooler than water at the surface. When it is released suddenly in water bodies, the temperature of the water there is reduced significantly, which is very dangerous for aquatic organisms and may affect

their breeding. The eggs and larvae of various aquatic animals are highly susceptible to temperature changes.

Question 8.

How is the life of organisms living in water affected when water gets polluted?

[NCERT Exemplar]

Answer:

Addition of undesirable chemicals like pesticides, fertilisers, industrial wastes and domestic wastes not only kill the aquatic organisms, they also cause water-borne diseases. With the addition of pollutants, the phytoplankton and other organisms require more oxygen for their degradation, thus decreasing the amount of oxygen available in water. Due to this reduction in the dissolved oxygen in water, there are adverse effects on the aquatic organisms leading to their deaths.

Question 9.

Enlist the main causes of soil erosion.

Answer:

The main causes of soil erosion are:

- deforestation;
- excessive overgrazing;
- urbanisation; and
- leaving the land uncultivated for a long time.

Question 10.

Why is replenishment of soil essential? Describe two natural ways of soil replenishment.

Answer:

Some nutrients of the soil get depleted by growing the same crop year after year. So, replenishment of the soil is essential to keep it fit for further cultivation.

Two natural ways of soil replenishment are:

- Crop rotation, and
- Leaving the agricultural land uncultivated for one or two seasons so as to allow it to regain its fertility.

Question 11.

“Soil is formed by water.” If you agree to this statement then give reasons for your answer. [NCERT Exemplar]

Answer:

Water helps in formation of soil in the following ways:

- Water wears off the rocks over a long period of time.
- Small rocks in the flowing water rub against other rocks creating small particles which are carried away downstream and deposited as soil.
- Water expands on freezing. So when it is deposited in crevices of rocks, rocks crack into smaller pieces.

Question 12.

What is the role of plants in controlling air pollution?

Answer:

There is a balance between the CO₂ which occurs at the Earth's surface, CO₂ dissolved in oceans, and that found in marine and terrestrial sediments. The burning of fossil fuels increases the amount of CO₂ in the atmosphere causing air pollution. Plants control air pollution because during the process of photosynthesis, they take in CO₂ from the atmosphere and in turn release O₂. Thus, decreasing the level of CO₂ in the atmosphere.

Question 13.

What is photochemical smog and what are its effects?

Answer:

Oxides of nitrogen combine chemically in sunlight and produce hydrocarbons, peroxyacetal nitrate (PAN), and ozone which are commonly known as photochemical smog. This is very harmful and makes eyes watery, affects the growth of plants by checking the rate of photosynthesis and increases the rate of transpiration.

Question 14.

Describe the major factors which lead to water pollution. Give examples.

Answer:

The following are the major factors which lead to water pollution:

- The addition of undesirable substances to water bodies. For example, addition of industrial wastes containing poisonous salts like pesticides, insecticides, etc. are fatal for aquatic life.
- The removal of desirable substances from water bodies. For example, depletion of dissolved oxygen and nutrients has adverse effects on aquatic life.
- Change in temperature of water in the water bodies. The aquatic animals are adapted to live under certain temperature range. A sudden change of temperature may affect breeding of aquatic animals, their eggs and larvae, etc. For example, pouring of water at very high temperature from nuclear reactors may cause death of fishes and aquatic animals. Similarly, pouring cold water from dams also affects aquatic life adversely.

Question 15.

What are the harmful effects of water pollution?

Answer:

- Polluted water causes a number of water-borne diseases like cholera, typhoid, jaundice, diarrhoea, hepatitis and dysentery.
- Presence of acids or alkalies in water destroys certain microorganisms, which carry out the self-purification process in rivers.
- Decrease in the amount of dissolved oxygen in the water body adversely affects the life of aquatic organisms.
- Change in water temperature disturbs the aquatic life as eggs and larvae of various animals are badly affected by such changes.

Question 16.

Give the names of a few organisms that help in nitrogen fixation.

Answer:

- Rhizobium helps in the fixation of atmospheric nitrogen into ammonia.
- Nitrosomonas converts ammonia to nitrates
- Nitrobacter converts nitrites into nitrates.

Question 17.

How are CFCs harmful for the environment and living beings?

Answer:

CFCs contain both chlorine and fluorine. CFCs are very stable and do not get degraded by any natural process. In the ozone layer present in the outer region of the atmosphere (25-40 km above sea level), CFCs are dissociated by ultraviolet light to release free chlorine atoms. Free chlorine atoms catalyse the breakdown of ozone molecules (O_3) into oxygen. This results in degradation of the ozone layer. Thinning of the ozone layer would allow penetration of ultraviolet light into Earth's atmosphere causing blindness, skin cancer and mutations.

Question 18.

What will be the consequences of global warming?

Answer:

An increase in global temperatures can cause:

- change in the amount and pattern of precipitation, i.e., rain, snow, etc.
- melting of polar ice and rise of sea level,
- extreme weather conditions like floods, droughts, heat wave, hurricanes and tornadoes, etc.

Question 19.

Why is the circulation of carbon in nature important?

Answer:

The carbon in the form of food travels to animals from plants through food chains. In atmosphere the concentration of carbon dioxide is very low— only about 0.03% to 0.04%. Therefore, if carbon dioxide is not circulated back to our nutrient pool, there will be shortage of CO_2 and plants will not be able to carry out photosynthesis and the whole cycle will be disrupted. Combustion of fuel also adds carbon dioxide in the atmosphere. Carbon thus cycles through physical and biological activities.

Long Answer Questions

Question 1.

How has industrialisation led to an increase in air pollution? What steps should be taken to check air pollution?

Answer:

Industrialisation has led to increased pollution of air in following ways:

- Due to industrialisation, the consumption of fossil fuels has increased. Combustion of fossil fuels has increased production of gases like CO, SO₂, SO₃, NO₂ and CO₂ which are toxic.
- There has been depletion in the ozone layer because of increase in the production of chemicals like chlorofluorocarbons which are used as insulators, refrigerants, solvents and aerosol propellants. This has resulted in the entry of UV rays into Earth's atmosphere, which has affected various organisms.
- Combustion of fossil fuels also increases the amount of suspended particles in air causing pollution.

Steps taken to check air pollution are:

- Planting more trees, as they purify air by intake of CO₂ gas and release of O₂. This will reduce the greenhouse effect.
- Reducing the consumption of fossil fuels.
- Laying emphasis on the use of non-conventional sources of energy like wind energy, solar energy, tidal energy, etc., which reduce pollution to great extent.

Question 2.

What is the importance of water for plant life?

Answer:

Water is very essential for the survival and growth of plants.

- Seeds germinate in the presence of water.
- Water helps in the growth of plants.
- Plants manufacture their food by the process of photosynthesis in the presence of sunlight, carbon dioxide, water and a green pigment called chlorophyll.
- Water dissolves the nutrients present in the soil which is then transported to the various parts of the plant.
- Water provides a medium for transportation of food and minerals within the plant.
- Water also helps in maintenance of the plant structure by providing appropriate pressure to the plant tissues.

Question 3.

How is carbon stored in our planet?

Answer:

Carbon is stored in the following ways.

- As organic molecules, in the living and dead organisms found in the biosphere.
- As carbon dioxide in the atmosphere.
- As organic matter in soils.
- As fossil fuels and sedimentary rock deposits such as lime stone, dolomite and chalk.
- In the oceans as dissolved atmospheric carbon dioxide and as carbonate shells in marine organisms.

Question 4.

What are the sources of soil pollution?

Answer:

Soil pollution mainly results from the following sources:

- Industrial wastes: wastes discharged from pulp and paper mills, chemical industries, oil refineries, coal and mining industries, etc., are responsible for soil pollution.
- Urban wastes: solid wastes and refuse in urban areas contribute to soil pollution.
- Radioactive pollutants: radioactive substances resulting from explosions of nuclear devices, atmospheric fall out from nuclear dust penetrate the soil and pollute it.
- Fertilisers: excessive application of fertilisers to the soil to increase food and vegetable production causes soil pollution.
- Pesticides: different kinds of pesticides used to control pests cause soil pollution.
- Farm wastes: wastes from cows, cattle, pigs and poultries are one of the major sources of soil pollution.
- Chemical and metallic pollutants: synthetic chemicals are a source of trace metals which are added to the soil either deliberately or as an impurity.
- Biological agents: soil gets large quantities of human, animal, bird excreta which constitute the major source of soil pollution by biological agents.

Question 5.

What are the effects of soil pollution?

Answer:

Effects of soil pollution:

- Chemicals, pesticides, metals, industrial wastes, animal refuse and other pollutants are extremely toxic to living beings and plant products, and cause severe chronic diseases posing a serious threat to human health.
- Solid wastes result in offensive odour and cause clogging of groundwater filters.
- Polluted soil damages crops and agricultural production due to decreased soil fertility.
- When food containing radioactive substances is consumed by human beings, they cause a number of undesirable diseases of the digestive track, thyroid gland, etc.
- Pesticides not only pose a potential hazard to man, animal, fish and livestock, but they severely affect the desired yield of crops, fruits and vegetables, which become unfit for eating.

Question 6.

How can we control soil pollution?

Answer:

Following measures may be taken to control soil pollution:

- Proper dumping of unwanted materials.

- Organic wastes contained in animal dung can be used for preparation of compost, manure and biogas rather than throwing them as waste and polluting the soil.
- Natural soil microorganisms should be used to increase the soil fertility rather than the use of pesticides and insecticides.
- To minimise soil pollution, waste such as paper, plastics, glass, metals, chemicals and industrial wastes should be recycled and reduced instead of throwing in the soil.
- Use of chemicals, insecticides, etc., should be banned.

Question 7.

Describe the water cycle.

Answer:

The water cycle is the journey water takes as it circulates from the land to the sky and back again. It involves the following steps:

- The Sun's heat provides the energy for evaporation of water from the Earth's surface (oceans, lakes, rivers, etc.)
- Plants also lose water into the air by the process of transpiration.
- Wind carries the moisture laden air. The water vapour eventually condenses forming tiny droplets in clouds. When clouds meet cool air over the land, precipitation (rain, hail or snow) is triggered and water returns to the land in the form of rainfall.
- All water that falls on the land does not immediately flow back into the sea. Some water seeps into the ground. Some of the underground water is trapped between rocks or clay layers. This is called ground water. Some of this ground water finds its way to the surface through springs. We also bring the ground water to the surface for our use through wells or tube wells. Water is also used by terrestrial animals and plants for various life processes. Most of the water flows down the hills as run offs (above the ground or underground), eventually returning to the seas as slightly salty water.

Question 8.

Describe the steps and processes involved in the nitrogen cycle.

Answer:

The various steps of nitrogen cycle are as follows:

- Nitrogen fixation: It is the conversion of atmospheric nitrogen into water-soluble compounds like nitrates and nitrites either by the free-living bacteria or Rhizobium that are found in the root nodules of legumes. Atmospheric nitrogen also gets converted into nitrates and nitrites naturally by lightning.
- Ammonification: Death and decay of plant bodies release ammonia into the atmosphere. Animals also give out ammonia along with urea and uric acid as excretory products. These nitrogenous compounds are converted to ammonia by putrefying bacteria and the process is known as ammonification.
- Nitrification: Ammonia is then converted first into nitrites and then into nitrates by the nitrifying bacteria, the process being called as nitrification. Plants generally take up nitrates and nitrites and convert them into amino acids.

- Denitrification: When the animal or the plant dies, denitrifying bacteria in the soil convert the various compounds of nitrogen back into nitrates and nitrites. The nitrates and nitrites are converted into elemental nitrogen by *Pseudomonas*. This process is called denitrification.

Question 9.

Why is replenishment of forests necessary?

Answer:

Forests need to be replenished because of the following reasons:

- Rainfall: During transpiration, trees give out enormous amount of water vapour. This water vapour helps in the formation of rain clouds. So, if trees are cut and not replenished, the rainfall in the area will reduce.
- Natural rate of tree growth: Forests cannot be regrown in a few days or months as trees take many years to grow fully. Thus, it becomes necessary to replenish the forests periodically.
- Soil erosion: If a large number of trees are cut, the soil becomes naked. The top soil, which is rich in organic matter will be washed away by water or carried away by wind. Trees help in binding the soil.
- Carbon dioxide-oxygen balance: Forests have a very large number of trees which give out O_2 and take in CO_2 in the day by photosynthesis. In this way, they help in maintaining the carbon dioxide-oxygen balance in the atmosphere.
- Timber and fuel: Forests are the best suppliers of timber for furniture and fuel. So, for their constant supply forests need to be replenished.

Question 10.

What are the sources of oxygen in the atmosphere?

Answer:

Sources of oxygen in the atmosphere:

- Early in the evolution of the Earth, oxygen is believed to have been released from water vapour by ultra-violet radiations and accumulated in the atmosphere as the hydrogen escaped into the outer layer of the Earth's atmosphere.
- The main driving factor of the oxygen cycle is when water and carbon dioxide combine in the presence of sunlight and chlorophyll to form glucose and oxygen by the process of photosynthesis.
- Molecular oxygen is mainly contained in rocks and minerals.
- Molecular oxygen is also released in the atmosphere by the process of photolysis.
- The weathering process initiated by organisms can also free the oxygen from the lithosphere.
- Plants and animals extract nutrient minerals from rocks and release oxygen in the process.

Question 11.

Why is it necessary to conserve natural resources? How can they be conserved?

Answer:

Natural resources are a precious gift of nature to the mankind. The natural resources and the living organisms are interdependent on each other and form the biosphere.

We should use them judiciously for our benefit, but avoid their depletion. The only way to create balance and harmony with nature is to conserve our natural resources. Some of the ways of conservation of our natural resources are:

- They should be protected from being polluted.
- More and more vegetation should be planted and endangered species of plants and animals should be protected.
- The wild animals should be conserved by establishing national parks and sanctuaries.
- Hunting of animals should be prohibited.
- Recycling of waste materials must be encouraged.
- We should use alternative sources of energy rather than conventional sources like fossil fuels.

HOTS (Higher Order Thinking Skills)

Question 1.

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

Answer:

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.

Question 2.

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

Answer:

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.

Question 3.

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

Answer:

The nitrogen inhaled during respiration is not used in the body and it comes out with CO₂ during exhalation.

Question 4.

Why does moon have very cold and very hot temperature variations, e.g., from 190°C to 110°C, even though it is at the same distance from the Sun as the Earth is?

Answer:

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.

Question 5.

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

Answer:

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.

Question 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.

Answer:

Earth's atmosphere has less carbon dioxide because:

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

Question 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. [NCERT Exemplar]

Answer:

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.

Question 8.

Why do people love to fly kites near the seashore? [NCERT Exemplar]

Answer:

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.

Question 9.

Why does Mathura refinery pose problems to the Taj Mahal? [NCERT Exemplar]

Answer:

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.

Question 10.

Why do not lichens occur in Delhi whereas they commonly grow in Manali or Darjeeling? [NCERT Exemplar]

Answer:

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.

Question 11.

During summer, if you go near the lake, you feel relief from the heat, why? [NCERT Exemplar]

Answer:

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.