

Natural Resources

ONE MARK QUESTIONS

1. Name the three processes which used oxygen.

Ans :

Combustion, respiration and in the formation of oxides of nitrogen.

2. Give two natural resources available on the Earth.

Ans :

Water and air.

3. Write one example of biotic component of the biosphere.

Ans :

All animals, plants and microorganisms.

4. Identify which of the following are not the part of biotic environment : soil, plants, fish, air, insects.

Ans :

Soil, air.

5. Name two oxides formed by burning of fossil fuels, which are responsible for acid rain.

Ans :

The oxides of nitrogen and sulphur :
(i) Sulphur dioxide and sulphur trioxide.
(ii) Nitrous oxide and nitrogen dioxide.

6. Mention the two forms of precipitation in nature when the temperature of air is very low.

Ans :

(i) Fog and smog,
(ii) Hail,
(iii) Mist, (any two).

7. Name the factor responsible for change in rainfall patterns in India.

Ans :

Rainfall patterns are decided by the prevailing wind patterns. In large part of India, rains are mostly brought by South-West or North-East monsoons.

8. Combustion of fossil fuels results in the increase of suspended particles in the air. What are these particles?

Ans :

The suspended particles in the air could be unburnt

carbon particles or hydrocarbons which lead to smog.

9. How the frozen water between cracked rocks causes the cracks to widen?

Ans :

The water inside the cracked rocks expands on freezing. When it expands, its volume increases and it causes the cracks to widen.

10. Name two gases which cause greenhouse effect.

Ans :

(i) Carbon dioxide, (ii) Methane.

11. Name two biologically important compounds that contain both oxygen and nitrogen.

Ans :

Proteins and nucleic acids (DNA and RNA).

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12. What is the function of humus in soil?

Ans :

Humus causes the soil to become more porous and allows water and air to penetrate deep underground.

13. Name two essential biological molecules in which oxygen is present.

Ans :

(a) Proteins,
(b) Carbohydrates,
(c) Fats and lipids,
(d) Nucleic acids (any two)

14. Name two biologically important compounds that contain both oxygen and nitrogen.

Ans :

Proteins and nucleic acids (DNA and RNA).

15. What is the greenhouse effect?

Ans :

Some gases prevent the escape of heat from the Earth. An increase in the percentage of such gases in the atmosphere would cause the average temperatures to increase worldwide and this is called the greenhouse effect.

16. The atmosphere acts as a blanket, how?

Ans :

Air is a bad conductor of heat which keeps average temperature of the Earth steady during day and at night. The ozone shield of the atmosphere absorbs most of the harmful radiations coming from Sun.

17. List any two traditional systems of water harvesting.

Ans :

Two traditional systems of water harvesting are :
Collection of water in ponds and construction of small Earthen dams.

18. Define anaerobic degradation.

Ans :

Breakdown of organic matter by microorganisms when oxygen is not present is known as anaerobic degradation.

19. State two reasons each of conserving (a) forest and (b) wildlife.

Ans :

Two reasons each of conserving :

- (a) Forest
(i) It helps in retaining the sub-soil water.
(ii) It checks flood.
(b) Wildlife
(i) To maintain ecological equilibrium.
(ii) To protect the nature.

20. 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?

Ans :

Absence of atmosphere on the Moon.

21. What is the importance of carbon cycle?

Ans :

It helps to maintain a constant level of CO_2 in the Earth's atmosphere which further help in maintaining Earth's temperature through greenhouse effect.

22. Why does the percentage of gases like oxygen, nitrogen and carbon dioxide remain almost the same in the atmosphere?

Ans :

Cycling of these gases maintains consistency.

THREE MARKS QUESTIONS

23. Name four human activities which cause air pollution.

Ans :

Mining : Mining activities release dust.

Thermal power plants : Air pollution caused by burning of fossil fuel.

Firework on festivals : It results in the release of toxic chemicals into air.

Burning of fossil fuel : In industries, automobiles, domestic purposes, etc.

24. Name the stages of the life cycle of aquatic animals which are affected by change in temperature.

Ans :

The eggs and larvae of various aquatic animals are sensitive to temperature changes. Sudden change in the temperature in the water body would be dangerous for them or affect their breeding.

25. How do Sun and wind influence the formation of soil?

Ans :

Sun : The Sun heats up rocks during the day to expand the rocks and at night they cool down and contract. This result in the formation of cracks and rocks finally break up into smaller pieces.

Wind : Strong winds help in the formation of rock particles by their erosion. This helps in formation of soil.

26. Define weathering. Write the different means which cause weathering.

Ans :

The process of breaking down of rocks into small, fine mineral particles is called weathering. The weathering may occur due to physical, chemical or biological means.

27. Write the composition of soil. On what basis is the type of soil decided?

Ans :

Soil is a mixture and composed of small particles of rocks of different sizes, humus and various microorganisms. The type of soil is decided by the average size of particles found in it.

28. What is the major source of freshwater in the city/town/village where you live?

Ans :

The major source of freshwater in the city is the underground water which is mostly taken out with the help of hand pumps. The rivers lakes and ponds flowing in the nearby areas also serve as the source of freshwater.

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29. What is soil erosion?

Ans :

The removal of topsoil which is rich in humus and nutrients by flowing water or wind is known as soil erosion. All soil may get eroded if this process continues further. It may lead to the loss of all valuable resources because nothing grows as such on the rocks.

30. What are the two forms of oxygen found in the atmosphere?

Ans :

- (i) Elemental oxygen is normally found in the form of a diatomic molecule (O_2) in the lower regions of the atmosphere to the extent of 21%. It is non-poisonous form of oxygen.

(ii) But in the upper part of the atmosphere (stratosphere), it occurs in the form of ozone, containing three atoms of oxygen and having the molecular formula O_3 . It is the poisonous form of oxygen.

31. What are the different ways in which water gets polluted? How does it affect the life forms?

Ans :

The addition of undesirable substances like fertilizers and pesticides, mercury salts in water/can cause cholera produced by the bacteria.

The removal of desired substances like oxygen from the water/adversely affect the aquatic organisms.

A sudden change in temperature in water bodies/would be dangerous and affect their breeding. The eggs and larvae are affected by the change in temperature.

32. What are the biogeochemical cycles? Name the gas that is incorporated into life forms through photosynthesis.

Ans :

The transfer of energy and matter between the biotic components of the biosphere is called biogeochemical cycle. The gas that is incorporated into life forms through photosynthesis is carbon dioxide.

33. List the causes that affect the life forms that are found in water bodies in various ways. Name the element present in coal other than carbon that releases harmful gases during combustion of coal.

Ans :

- (i) Excess of fertilizers and pesticides used in the farms are washed into water bodies.
- (ii) Dumping of sewage from dwelling places into water bodies.
- (iii) Release of contaminated water from industries.
- (iv) Release of water from dams affects the temperature of river.
- (v) Sulphur and nitrogen.

34. Explain how the nitrogen molecules are converted into nitrates and nitrites by :

- (i) Biological process,
- (ii) Physical process.

Ans :

- (i) **Biological process** : Nitrogen fixing bacteria found in the root nodules of the legumes convert nitrogen molecules to nitrates and nitrites.
- (ii) **Physical process** : The high temperature and pressure created in the air convert nitrogen into oxides of nitrogen during lightning.

35. What is the main cause of increase in CO_2 in atmosphere? Explain the harmful effect of increase in CO_2 content in atmosphere.

Ans :

The main cause of increase in carbon dioxide in the atmosphere is industrial revolution. Increase in carbon dioxide gives rise to greenhouse effect and global warming. This causes imbalance in nature, affects

monsoons and rainfall.

36. What is ozone hole? Where is it found? What is its effect?

Ans :

There is a layer of ozone in the upper regions of the atmosphere which gets depleted due to chlorofluorocarbons and created a hole that is called ozone hole. It is found above North Pole.

37. Which cycle is known as the perfect cycle in biosphere? Why?

Ans :

Nitrogen cycle is known as the perfect cycle in biosphere as it maintains the amount of nitrogen in atmosphere, water and soil.

38. Name the various organisms involved in nitrogen cycle.

Ans :

- (i) Nitrogen fixing bacteria, e.g., Rhizobium, Azotobacter.
- (ii) Bacteria which convert complex nitrogenous organic compounds (proteins) into ammonia, e.g., Actinomyces.
- (iii) Nitrifying bacteria that convert ammonia into nitrates, e.g., Nitrosomonas and nitrobacter.
- (iv) Denitrifying bacteria, e.g., Pseudomonas.

39. What are the three ways by which CO_2 is returned back into atmosphere?

Ans :

The three ways by which CO_2 is returned back into atmosphere are :

- (i) Decomposition of dead organic matter.
- (ii) Respiration by both plants and animals.
- (iii) Formation of gaseous waste by the combustion of fuels like coal, wood and petrol.

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40. Define biosphere. Name its components.

Ans :

Biosphere is global ecological system integrating all living beings and their relationships, including their interaction with the elements of lithosphere, geosphere, hydrosphere and atmosphere. The two components of biosphere are :

- (i) **Biotic** : All living organism such as plants, animals and microorganisms.
- (ii) **Abiotic** : Air, water and the soil.

41. Mention three ways by which atmosphere regulates the average temperature on Earth.

Ans :

- (i) As the air is a bad conductor of heat, therefore, the atmosphere keeps the average temperature of the Earth fairly steady during the day even during the course of the whole year.
- (ii) The atmosphere prevents the sudden increase in

temperature in day time.

- (iii) It slows down the escape of heat into the outer space.

42. Mention any three important roles of water required for organisms on the Earth's surface.

Ans :

- (i) All cellular processes take place in water medium.
 (ii) Water regulates body temperature.
 (iii) Water is required for transportation of nutrients from one part of the body to the other.

43. (a) Explain, how soil pollution is caused?
 (b) Write three ways to prevent soil pollution.

Ans :

- (a) The soil pollution may be caused by throwing the industrial wastes in vacant sites viz., along the roads, railway tracks, etc. The wastes from residences, cattle sheds, industries, agricultural fields, etc. also pollute the soil. The excessive use of fertilizers and pesticides pollutes the soil.
 (b) Three ways to prevent soil pollution :
 (i) By judicious use of fertilizers and pesticides
 (ii) By proper management of disposal of household waste
 (iii) Terrace farming should be practiced

44. Explain the following terms :

- (i) Nitrogen fixation,
 (ii) Nitrification,
 (iii) Denitrification.

Ans :

- (i) The process in which atmospheric nitrogen is converted into usable forms like ammonia, nitrates, nitrites or NO_2 , etc. is called nitrogen fixation.
 (ii) The process of formation of nitrites and then to nitrates from ammonium compounds is called nitrification.
 (iii) The process of conversion of some ammonium compounds, nitrites and nitrates into molecular nitrogen is called denitrification.

45. In what forms the water is found on the Earth's surface? Describe in brief.

Ans :

Most of the water on Earth's surface is found in the form of liquid in seas, oceans, rivers, lakes, ponds, etc. It is found in the form of ice (solid) in the ice-caps on mountain peaks and in Polar Regions. Water is also found in vapour state when it evaporates at the surface of water bodies, as moisture in the atmosphere, air transpired by plants and air exhaled by animals.

46. (a) In what ways the water cycle helps the marine organisms?
 (b) 'The biosphere is a dynamic but stable system.' Justify this statement.

Ans :

- (a) (i) Water is capable of dissolving a large number

of substances.

- (ii) Water flows through rocks containing soluble minerals.
 (iii) Some of the minerals get dissolved in the water which is carried by water bodies and made available to aquatic organisms.
 (b) (i) There is a constant interaction between the biotic and abiotic components of the biosphere.
 (ii) These interactions consist of a transfer of matter and energy between the different components of the biosphere and make it a dynamic but stable system.

47. Describe how lichens and big trees influence the formation of soil.

- (i) Lichens grow on the surface of rocks and release substances that breaks down the rock surface.
 (ii) Moss grows on this surface and breaks it further.
 (iii) The roots of trees grow into rocks, form cracks and widen them further to form soil.

48. How is soil formed? List four factors which play a vital role in the formation of soil.

Ans :

Soil is formed by breakdown of rocks by various physical, biological and chemical processes. Following factors play important role in the formation of soil :

- (i) Temperature variations due to solar radiation,
 (ii) Rainwater,
 (iii) Wind,
 (iv) Living organisms.

49. Write the name of triatomic molecule of oxygen. Is its presence necessary in nature?

How does it affect the environment? Explain.

Ans :

- (i) The triatomic form of oxygen is called ozone.
 (ii) Yes, its presence is necessary in nature.
 (iii) Ozone absorbs the harmful radiations from the Sun and, thereby protects many forms of life from getting damaged.

50. Fertile soil has lots of humus. Why?

Ans :

Fertile soils are rich in organisms that decompose dead organic matter forming humus. Humus gives minerals, absorbs water and makes soil porous.

51. Define the terms :

- (i) Soil, (ii) Paedogenesis.

Ans :

- (i) **Soil** : It is the humus containing and life sustaining weathered uppermost crust of Earth.
 (ii) **Paedogenesis** : The process of formation of soil is called paedogenesis.

52. Give two examples where oxygen is not playing any role in supporting life.

Ans :

- (i) Some bacteria are poisoned by elemental oxygen.

- (ii) The process of nitrogen-fixing by bacteria does not take place in the presence of oxygen.

53. List any four disadvantages of using fossil fuels for the production of energy.

Ans :

Disadvantages :

- (i) Fossil fuels cause pollution.
- (ii) They also cause acid rain.
- (iii) They disturb ecology.
- (iv) They cannot be reused, i.e. they are non-renewable.

54. Suggest three ways to maintain a balance between environment and development to survive.

Ans :

The three ways to maintain a balance between environment and development to survive are as follows:

- (i) Forest resources should be used in an environment friendly and developmentally sound manner.
- (ii) Instead of using non-renewable natural resources, use of renewable natural resources should be preferred.
- (iii) Waste water generated by industries should be recycled.
- (iv) We should use natural resources cautiously so that economic growth and ecological conservation go hand in hand.

55. State an instance where human intervention saved the forests from destruction.

Ans :

Human intervention saved the Arabari forest range of West Bengal from destruction with active and willing participation of local community. The Sal forest of Arabari underwent a remarkable recovery.

56. What are the consequences of global warming?

Ans :

- (i) An increase in temperature of Earth even by 1°C may lead to melting of ice on the poles.
- (ii) The melting of ice will result in rise of sea level.
- (iii) Due to rise in sea level, many coastal cities will be flooded or submerged.
- (iv) Increase in temperature of Earth, results the changes in weather and may cause excessive raining or drought or extreme hot or cold weather conditions.

57. How do advantages of exploiting natural resources with short-term aims differ from the advantage of managing our resources with a long-term perspective?

Ans :

Exploiting resources with short-term aim is just to reap huge profit, whereas using resources with a long-term perspective is to reap the benefit in a sustainable manner so that these will last for generations to come.

58. "Burning fossil fuels is a cause of global warming."

Justify this statement.

Ans :

Fossil fuels like coal and petroleum are formed from biomass. In addition to carbon, they contain hydrogen, nitrogen and sulphur. When fossil fuels are burnt, the products are carbon dioxide, water vapour, oxides of nitrogen and oxides of sulphur. Carbon dioxide is a greenhouse gas. Increase in the percentage of carbon dioxide increases the temperature on Earth which leads to global warming.

59. How is reuse better than recycling?

Ans :

'Sustainable management' is the management of resources in which development can be maintained for a long time without undue damage to the environment. Recycling needs additional energy to make a usable item. Reuse does not require additional energy and hence, is better than recycle.

60. How did 'Chipko Andolan' ultimately benefit the local people? Describe briefly.

Ans :

Chipko Movement :

- (i) During 1970, in Reni village of Garhwal, a contractor was allowed to cut trees in a forest near the village.
- (ii) When the contractor's workers went to the forest to cut trees, the women of the village hugged the tree trunks to prevent the workers from cutting trees.
- (iii) Chipko means 'hug' and the movement began with the villagers hugging trees. It is called the 'Chipko Andolan'.
- (iv) The movement benefited the local population as it conserved the forest products. It benefited the environment as it conserved the quality of soil and sources of water thereby, maintained balance in nature.

61. Which of the two is a better option, (i) to collect rainwater in ponds or artificial lakes, or (ii) to let it recharge groundwater by water harvesting? List two advantages of the option to justify your Answer.

Ans :

To allow rainwater to recharge groundwater by water harvesting is the better option. Its advantages are :

- (i) Groundwater does not evaporate.
- (ii) Groundwater does not provide breeding ground for mosquitoes.

62. How is soil formed?

Ans :

The rocks near the surface of the Earth are broken down by various physical, chemical and some biological processes over long periods of time, thousands and millions of years. Finally, fine particles of soil formed. There are many other factors which play a vital role in the formation of soil. These factors are :

- (i) The Sun heat, (ii) Water, (iii) Wind, (iv) Living organisms.

63. List any two causes of our failure to sustain availability of underground water.

Ans :

Two causes of our failure to sustain availability of underground water are :

- (i) **Rising population** : As the population increases, demand for water increases resulting in depletion of underground water level.
- (ii) **Industrialization** : Industries need more and more water to manufacture products. With growing industrialization, demand for water increases which results in reduction in the availability of underground water.

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64. Do you know any activity which may be polluting water sources?

Ans :

There are many activities which cause pollution of water sources such as :

- (i) Dumping of waste from factories, sewage from our towns and cities into rivers,
- (ii) Discharging polluting water from cooling towers into the water bodies affects the breeding capacity of aquatic organisms.

65. What are the different states in which water is found during the water cycle?

Ans :

Three different states of water can be seen during the water cycle. These states are :

- (i) **Gaseous state** : Form of water vapour which evaporates from the surface water,
- (ii) **Liquid state** : Formed by the condensation of water vapour and can be seen in the form of rain,
- (iii) **Solid state** : Formed by the freezing of liquid droplets in the upper layer of atmosphere which can be seen in the form of snow, hail.

66. What causes winds?

Ans :

Winds are caused due to uneven heating of atmospheric air. This phenomenon can be seen near coastal regions during the daytime. The air above the land gets heated faster and starts rising. A region of low pressure is created as this air rises, and air over the sea moves into this area of low pressure. The movement of air from one region to the other creates winds. During the day, the direction of the wind would be from the sea to the land.

67. List any four characteristics of a good fuel.

Ans :

- (i) Higher calorific value
- (ii) Lesser pollution
- (iii) Sustainable for longer period
- (iv) Easily transportable

68. "Soil is formed by water." If you agree to this

statement then give reasons.

Ans :

Water helps in the formation of soil in the following ways :

- (i) Water causes 'wear off' of rocks over a long period of time.
- (ii) It also causes the rocks to rub against other rocks creating small particles which are taken away downstream and deposited as soil.
- (iii) Water expands on freezing in crevices of rocks and break rocks into smaller pieces.

69. What causes movement of air? Mention the factors which influence these winds?

Ans :

- (i) Uneven heating of the atmosphere.
- (ii) Rotation of the Earth.
- (iii) Presence of mountain range.
- (iv) Difference in cooling and heating of land and water bodies.
- (v) Formation and condensation of water vapours. (any two)

70. How is the atmosphere of Venus/Mars different from that of the Earth? Name two main gases present in Earth's atmosphere.

Ans :

Venus and Mars	Earth
Major component of the atmosphere of Venus/Mars is carbon dioxide.	Gases present in Earth's atmosphere are nitrogen and oxygen.
Carbon dioxide constitutes upto 95-97% of atmosphere.	Carbon dioxide constitutes only 0.03 to 0.04% of atmosphere on Earth.

71. Dron took some soil in a beaker and added some water in it. Then stir with glass rod.

- (a) What do you think Dron observed?
- (b) What does her observation demonstrate?

Ans :

- (a) Bubbles coming out the soil.
- (b) Practical shows that air is present in the soil. It also shows that air in the porous space between the soil particles is replaced by water.

72. Why are forests considered "biodiversity hotspots"? List two ways in which an individual can effectively contribute to the management of forests and wildlife.

Ans :

Biodiversity is measured by the number of different life forms found in an area. In a forest, various species exist which include bacteria, fungi, ferns, plants, nematodes, insects, birds, reptiles and mammals. Forests are, therefore, considered as biodiversity hotspots. An individual can contribute in the management of forests and wildlife by :

- (i) Avoiding cutting down of forests and killing of wildlife.

- (ii) Educating people about the importance of forests and wildlife in our life.

73. What are the adverse effects of products of combustion of fossil fuels on the environment?

Ans :

When fossil fuels are burnt, carbon dioxide, water, oxides of nitrogen and oxides of sulphur are formed. If the combustion takes place in insufficient air, then carbon monoxide is formed instead of carbon dioxide. Of these products, the oxides of sulphur and nitrogen and carbon monoxide are poisonous gases and carbon dioxide is a greenhouse gas.

74. What is 'Chipko Movement'? Why should we conserve forests?

Ans :

'Chipko Movement' is a non-political public movement for conservation of natural habitat and wildlife by preventing excessive commercial exploitation of forests. Chipko means 'hugs' and the movement were started by the villagers of Garhwal by hugging trees to stop the contractor's workers from cutting the trees. We should conserve forests because it helps in protection of land, retaining sub-soil water, checking floods, and thereby maintain a balance in the ecosystem.

75. Give two examples each of the Renewable sources of energy and Non-renewable sources of energy.

Ans :

- (i) Geothermal energy, wind energy
(ii) Coal, petroleum

76. Write any four advantages of water stored in the ground.

Ans :

Four advantages of storing water in the ground are :

- (i) It does not evaporate.
(ii) It is relatively protected from contamination by human and animal wastes.
(iii) It does not provide breeding ground for mosquitoes.
(iv) It provides moisture for vegetation.

77. List any four benefit of water harvesting.

Ans :

Benefits of water harvesting are :

- (i) It provides drinking water.
(ii) It provides irrigation water.
(iii) It is responsible for the increase in groundwater level.
(iv) It reduces storm water discharge, urban flood and overloading of sewage treatment plants.

78. What is meant by exploitation of resources with short-term aims? List its four advantages.

Ans :

Exploitation of resources with short-term aims means consumption of resources for immediate requirement without their conservation for future. Its four advantages are :

- (i) It fulfils the requirement of mass population.
(ii) It provides industrial growth.
(iii) It provides economic development.
(iv) It makes life comfortable.

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79. Why must we conserve our forests? List any two causes for deforestation to take place.

Ans :

We must conserve our forests as they are of great value. The reasons for conserving forests are :

- (i) Forests help in protection of land and retaining sub-soil water.
(ii) Forests check floods and maintain ecosystem.
Therefore, forests must be conserved for economic and social growth.

Two causes for deforestation taking place are :

- (i) For industrial needs.
(ii) For development projects like building of roads or dams.

80. Why is the atmosphere essential for life?

Ans :

Atmosphere is essential for life because of the following reasons :

- a.. It keeps the average temperature of the Earth
b. It prevents the sudden increase in temperature
c. It contains all the important gases which are required for sustaining life on Earth. These gases are :
(i) Oxygen for respiration of living organisms
(ii) Carbon dioxide for photosynthesis
(iii) Nitrogen for providing inert atmosphere
(iv) Ozone layer to filter the harmful UV radiation from Sun

81. Name any two forest products, each of which is the basis for some industry.

Ans :

- (i) Pine wood for matchbox industry.
(ii) Bamboo for paper industry.

82. State two changes you can make in your habits to reduce the consumption of electricity or water.

Ans :

Two changes that can be made to reduce the consumption of electricity or water are :

- (i) Switch off lights and fans when not in use.
(ii) Leaked taps should be repaired immediately.

83. Give any four changes that you would like to incorporate in the lifestyle of students of your age to move towards a sustainable use of available resources.

Ans :

- (i) Follow the principle of three 'R's - Reduce, Recycle and Reuse.
(ii) Plant more trees.
(iii) Use public transport, school bus and car pools.
(iv) Switch off unnecessary lights and fans, thereby save electricity.

84. What are the various causes of soil erosion?

Ans :

Causes of Soil Erosion :

- (i) Wind – Carrying away the topsoil
- (ii) Rain – Unprotected topsoil by washing it down
- (iii) Improper farming
- (iv) Frequent flooding of rivers causes soil erosion
- (v) Deforestation

85. What is meant by sustainable management? The environmentalists are insisting upon “sustainable natural resource management”. State its four advantages.

Ans :

Sustainable management is the management of natural resources which requires a long-term perspective so that they last for generations to come and are not to be exploited by the short-term gains. Its four advantages are as follows :

- (i) Resources last for a longer duration.
- (ii) It provides steady economic growth.
- (iii) It helps in ecological conservation.
- (iv) It reduces pollution.

FIVE MARKS QUESTIONS

86. (a) Explain the formation of acid rain.
(b) What does the presence of smog in an area indicate?

Ans :

(a) Acid rain is the rainwater which have excessive amount of acids/i.e., sulphuric acid and nitric acid.

These acids are formed by the reaction of oxides of sulphur and nitrogen with water.

The oxides of sulphur and nitrogen are produced by combustion of fossil fuels in industries, automobiles, thermal power plants and domestic appliances, etc.

The sulphur and nitrogen, present in fossil fuels form these oxides by reacting with oxygen of air by the process of combustion.

(b) The presence of smog in an area indicates the high percentage of smoke released in the air by combustion of fossil fuel in industries or automobiles. It is an indicator of air pollution.

87. What are the harmful effects of air pollution?

Ans :

- (i) Respiratory problems like sneezing, allergy, asthma or bronchitis in some persons.
- (ii) Cause acid rain which leads to deterioration of metals and other building material.
- (iii) Cause global warming which leads to change in the climate of the Earth.
- (iv) Carbon monoxide may lead to many problems of respiratory system.
- (v) Smog, which reduces the visibility as well as causes respiratory ailments.

88. (a) Where are ozone layer found?
(b) What is ozone hole and how is it caused?
(c) State the harmful effects of ozone depletion.

Ans :

- (a) Ozone layer is found in stratosphere.
- (b) Substances such as CFCs lower the ozone layer but do not directly destroy ozone. First they undergo photolysis, forming hydrogen chloride (HCl) or chlorine nitrate (ClNO₃), molecules that slowly decompose and give a small number of chlorine atoms (Cl) and chlorine monoxide (ClO) molecules that catalyze the destruction of ozone.
- (c) The depletion of ozone layer may cause :
 - (i) Skin cancer
 - (ii) Damage to eyes
 - (iii) Damage to immune system
 - (iv) In plants also it may increase the harmful mutations.

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89. State any four personal choices you would like to make to reduce energy consumption without affecting the quality of life or work explaining how each one of them would help you to do so.

Ans :

- (i) By switching off unnecessary lights and f This will reduce consumption of coal in production of electricity.
- (ii) By using public transport such as bus, metro, train, etc. as much as possible. This will reduce consumption of petrol and diesel.
- (iii) By repairing leaked water taps. We can save water by following this method. This will save energy that is spent during treatment and pumping of water.
- (iv) Reusing used paper, envelopes, etc. This will save the trees from which paper is made; it will also save energy spent on making and recycling papers.

90. (a) Explain how forests influence the quality of our air, soil and water resources.
(b) State two ways in which atmospheric carbon dioxide is fixed.

Ans :

- (a) Forests influence the quality of our air, soil and water resources in many ways :
 - (i) The vegetation/trees in the forest purify the air by the process of photosynthesis.
 - (ii) The roots of trees and plants bind the soil and prevent the soil erosion as well as floods.
 - (iii) The roots absorb the water present in the soil as groundwater.
 - (iv) The water released by the process of transpiration as water vapour becomes a part of atmosphere which helps to bring the rain.
 - (v) The forests also help to regulate the temperature of air.
- (b) (i) Carbon dioxide is fixed into carbohydrate by the process of photosynthesis.
(ii) The carbon dioxide is fixed in the form of carbonates and bicarbonates; compounds and

endoskeletons and exoskeletons of various animals are formed from carbonate salts.

91. List any three human activities which would lead to an increase in the carbon dioxide content of air.

Ans :

Three human activities which would lead to an increase in the CO₂ content of air are :

- (i) **Respiration** : It is the natural process of release of CO₂ by both plants and animals.
- (ii) **Combustion of fuels** : The various types of fuels are burnt to provide energy for various, needs like heating, cooking, transportation and industrial fuels.
- (iii) **Deforestation** : Trees help in the conversion of CO₂ into organic compounds such as glucose, starch, etc., by the process of photosynthesis but deforestation disturb this process and increase the level CO₂ increases in our environment.

92. How does nitrogen fixation take place during lightning? How do plants make use of the nitrates and nitrites present in soil?

Ans :

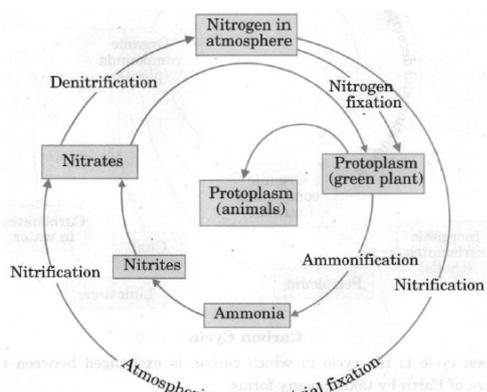


Figure: Nitrogen Cycle in Nature

The high temperatures and pressure created in the air convert nitrogen into oxides of nitrogen during lightning. These oxides dissolve in water to give nitrous and nitric acids that fall on land with rain.

Nitrogen fixing bacteria which are found in the roots of leguminous plants convert atmospheric nitrogen into nitrate (the usable form by plants).

The plants use nitrogen in the form of nitrates and nitrites to form amino acids and proteins. The plants are used as food by animals.

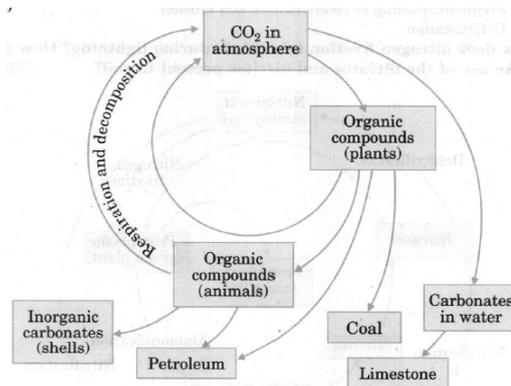
The bacteria convert these compounds of nitrogen into nitrates and nitrites, after the death of plants and animals.

Some other types of bacteria convert nitrites and nitrates into molecular nitrogen, which escapes into atmosphere and becomes a part of it.

93. Draw labelled diagrams of (a) Carbon cycle (b) Oxygen cycle and briefly explain oxygen cycle.

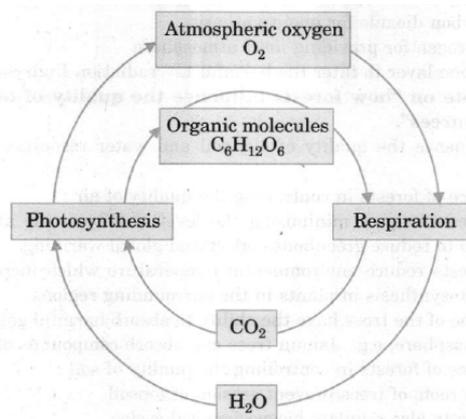
Ans :

(a) Carbon cycle :



Carbon cycle is the cycle in which carbon is exchanged between the various sphere of Earth by taking many forms.

(b) Oxygen Cycle :



Oxygen from the atmosphere is used up in combustion, respiration and in the formation of oxides of nitrogen. Oxygen is returned to the atmosphere through photosynthesis. This constitutes oxygen cycle in nature.

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94. What are the methods of preventing or reducing soil erosion?

Ans :

The methods of preventing soil erosion are :

- (i) **Afforestation** : Plants reduce erosion as the roots of plants bind the soil in place.
- (ii) **Shelter belts** : Trees planted in lines around farmland reduce erosion by reducing the speed of the wind.
- (iii) **Contour ploughing** : Farmers plough land so that furrows lie across the natural slope of the land which do not allow it to flow down carrying the topsoil.
- (iv) **Terrace farming** : A terraced hillside is a series of steps formed by horizontal strips supported by walls. It gives the water sufficient time to percolate into the soil and nourish the crop.
- (v) **Soil cover** : Soil left bare after harvesting a crop is often covered with dried vegetation to prevent erosion.
- (vi) **Preventing overgrazing** : Even a very little grass on a field prevents erosion of soil as the grass has a tendency to bind soil molecules.

95. Write a note on “how forests influence the quality of our air, soil and water resources”.

Ans :

Forests influence the quality of air, soil and water resources in the following ways :

- (i) Influence of forests in controlling the quality of air:
 - (a) Forests help in minimising the level of CO₂ in the atmosphere which help to reduce greenhouse effect and global warming.
 - (b) Forests reduce environmental temperature which increases the rate of photosynthesis in plants in the surrounding regions.
 - (c) Some of the trees have the ability to absorb harmful gases present in the atmosphere, e.g., Jamun trees can absorb compounds of lead easily.
- (ii) Influence of forests in controlling the quality of soil :
 - (a) The roots of trees prevent erosion of topsoil
 - (b) Forests also regulate biogeochemical cycles
 - (c) Many of the decomposing bacteria and nitrogen-fixing bacteria live in close association with the roots of the trees.
- (iii) Control the quality of water :
 - (a) Forests help in returning pure water back to the surface of Earth through rains.
 - (b) Forests help in maintaining the water cycle as well as water resources of the Earth.

96. Mention any three human activities which are responsible for water pollution.

Ans :

- (i) Excessive use of fertilizers and pesticides.
- (ii) Disposal of industrial waste which contains poisonous substances into nearby water bodies.
- (iii) Sewage discharged into sewers from household/ domestic units.
- (iv) Synthetic soap and detergents used during washing in household units.
- (v) Hot water released from industrial units.

97. What are the harmful effects of modern farming practices? Mention any three effects.

Ans :

- (i) Modern farming practices are based on excessive use of fertilizers and pesticides.
- (ii) These are used to increase the crop production as well as for pest and weed control.
- (iii) From the soil, these chemicals enter the food chain and affect the life of living organisms.

Harmful effects :

- (i) The excessive use of fertilizers and pesticides affects the fertility of soil.
- (ii) Harmful non-biodegradable chemicals enter the food chain and adversely affect the health of animals.
- (iii) Excessive use of fertilizers and pesticides in the long run reduces the soil fertility.

98. (a) What is the outermost layer of our Earth called?
(b) How is this important to life forms?

(c) Name four factors that help in the formation of soil from rocks.

Ans :

- (a) The outermost layer of our Earth is called crust. The outer crust of Earth is called lithosphere.
- (b) The living forms get all substances of their requirement for supporting life form this region.
- (c) (i) Winds,
(ii) Water,
(iii) Living organisms,
(iv) Temperature variations (due to solar radiation).

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99. ‘A change in temperature in the water body affects aquatic organisms.’ Explain in brief.

Ans :

Change in the water temperature can affect the aquatic life in the following ways : It can encourage the growth of some life forms and harm some other life forms. This affects the balance between various organisms which had been established in that system.

This can lead to removal of desirable substances like oxygen and other nutrients from water bodies.

The eggs and larvae of various animals are particularly susceptible to temperature changes.

So such aquatic life forms may become extinct from the related water bodies. Thus, the breeding of aquatic organisms will be affected.

100. Write in brief the harmful effects of water pollution.

Ans :

- (i) Causes water borne disease.
- (ii) Destroys microorganisms thereby affecting self purification of water.
- (iii) Decreases amount of dissolved O₂ in water bodies.
- (iv) Changes the temperature of water, oceans, leading to melting of polar ice.
- (v) Disturbs aquatic life.
- (vi) Kills aquatic organisms.

101. What is the chemical formula of ozone? What essential function does this gas perform and where it is found? What are CFCs?

Ans :

O₃ is the chemical formula of ozone.

Essential function :

- (i) It absorbs the harmful solar UV radiation to prevent various harmful effects on man, animals and plants.
- (ii) Ozone is found in the stratosphere, i.e., about 18-50 km above the atmosphere.
- (iii) CFCs (Chlorofluorocarbons) are synthetic harmful chemicals which are used in refrigerators and air conditioners as coolants, in fire extinguishers, in aerosol sprayers, etc. They are responsible for depletion of ozone layer in the atmosphere.

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Science IX

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