

**1. Define pollution.**

Pollution is defined as an undesirable change in the physical, chemical and biological characteristics of the environment.

**2. What are pollutants? Give example.**

The substance which brings about pollution is called pollutant. Ex: In air, smoke or dust particles is the pollutant.

**3. Give reason: Oxides of nitrogen released during lightning is not pollutant but oxides released by industries and automobiles are pollutant.**

Human interference causes the same substance to become a pollutant.

**4. What are biodegradable pollutants or temporary pollutants? Give examples.**

The pollutants that can be made harmless either by quick dilution to a very low concentration or by conversion are called biodegradable or temporary pollutants. They can be degraded by biological activity.

Example: Sulphur dioxide liberated by combustion of coal will get dissolved in rainwater and become diluted.

Sewage produced in cities can be made harmless by suitable biological treatment.

**5. Give reason: Sulphur dioxide or sewage is a biodegradable pollutant.**

Sulphur dioxide gets diluted with rainwater and becomes harmless.

Sewage is made harmless by biological activity.

Hence it is a biodegradable pollutant.

**6. Give reason: Sulphur dioxide / Sewage are referred to as temporary pollutants.**

The effect of sulphur dioxide or sewage remains in the environment only till it is converted into a harmless substance. Hence they are referred to as temporary pollutants.

**7. What are non-biodegradable pollutants? Give example**

The pollutants which cannot be converted into harmless constituents are called non-degradable pollutants.

Ex: Lead vapours released from diesel combustion, can accumulate in the lungs.

Insecticide like D.D.T from agricultural fields can accumulate in a pond.

**8. Give two ways in which non-biodegradable substances would affect the environment.**

a) Some of the non-biodegradable wastes like D.D.T enter the food chain and cause biomagnification.

b) Lead vapours from diesel combustion can accumulate in lungs.

**9. Give reason: Lead vapours or D.D.T is a non-biodegradable pollutant.**

Lead vapours or D.D.T cannot be converted into harmless substance by any known biological activity hence they are referred to as non-biodegradable pollutants.

**10. Distinguish between biodegradable and non-biodegradable pollutants.**

<b>Biodegradable pollutant</b>	<b>Non-biodegradable pollutant</b>
1. Pollutants which can be made harmless by quick dilution or conversion.	1. Pollutants which cannot be made harmless constituents
2. The effects remain in the environment only till converted into harmless substance	2. The effects remain as residue in the environment for a long time.
3. They can be decomposed by microorganisms.	3. They cannot be decomposed by any known microorganisms

**11. What is meant by bio-magnification?**

The phenomenon of increase in the concentration of toxic substances at each trophic level in a food chain is called bio-magnification.

**12. Define air pollution.**

Air pollution is defined as any human activity that brings about a significant change in the constituents of atmosphere.

**13. Name some serious environmental problems.**

Acid rain, global warming, depletion of ozone layer and climate change.

**14. Mention the main causes of air pollution.**

- a) Coal combustion
- b) Diesel combustion
- c) Petrol combustion
- d) Smoking of tobacco
- e) Waste incineration

**15. Explain the various causes of air pollution.**

**Coal combustion:** Coal is used as a major source of fuel in several industries. Coal combustion releases sulphur dioxide, carbon monoxide and small amounts of carbon dioxide which are pollutants.

**Diesel combustion:** Diesel is used as fuel in heavy duty vehicles and public transport vehicles. Combustion of diesel releases carbon monoxide and carbon dust which are pollutants.

**Petrol combustion:** Petrol is used as fuel in cars and two wheelers. Combustion of petrol releases oxides of nitrogen, carbon dioxide and lead vapours which are pollutants.

**Smoking of tobacco:** Smoking of tobacco in various forms releases high content of carbon monoxide which is a source of air pollution.

**Waste incineration:** Disposing of city garbage by burning them release carbon monoxide which is a pollutant.

**16. Give reason: Air pollution is not an outdoor phenomenon but also an indoor phenomenon.**

Just as various factors outside the house cause air pollution, activities like cooking, cleaning also causes indoor air pollution.

**17. Mention the common air pollutants and their effects.**

Pollutant	Sources	Effect on health
Sulphur oxide particles	Coal & oil power plants, oil refineries, smelters, kerosene stoves	Bronchial disease
Carbon monoxide	Burning of fossil fuels, emission from vehicles	Asphyxia leading to heart & nervous system damage, death
Oxides of nitrogen	Emission from automobiles, burning fossil fuels, power plants, oil refineries	Respiratory disorders
Ozone (O <sub>3</sub> )	Ozone generators, aircraft cabins	Respiratory disorders
Poly cyclic aromatic hydrocarbons	Diesel exhaust, cigarette smoke, stove smoke	Lung cancer
Asbestos	Asbestos mines & mills, insulation, building materials	Lung cancer, asbestosis
Arsenic	Copper smelters, cigarette smoke	Lung cancer
Allergens	Pollen, animal skin, House dust	Asthma, running nose

**18. Mention some sources of indoor air pollution.**

Molds and bacteria, carpets and upholstery, pollen, tobacco, pesticides and fumes from chemicals, dust mites, pets, animal hair and dead skin.

**19. Write some measures that can be taken to control air pollution.**

Industries must be established away from towns and cities.

Emission from industries must be checked and controlled.

Regulatory rules related to air pollution must be strictly enforced.

Automobiles must be periodically checked to improve the efficiency of engine and reduce the emissions.

Use of unleaded fuels and bio-fuels must be encouraged.

Educating people to use public transport.

Measures must be taken to check air pollution at source.

**20. Mention some measures that can be taken to control air pollution at source.**

- a) Reducing the use of vehicles for short travel.
- b) Using car pooling to travel & reducing individual vehicles.
- c) Installing electrostatic precipitators in chimneys of factories & industries.

**21. What is water pollution?**

Any change in physical (smell, colour taste), chemical and biological characteristics of water is called water pollution.

**22. What are the causes of water pollution?**

- a) Effluents from industries.
- b) Accumulation of sewage.
- c) Extensive use of pesticides & fertilizers in agriculture.

**23. Explain the causes of water pollution.**

- a) Effluent from industries: Waste materials from industries containing enormous quantities of chemicals are released into the nearby source of water like ponds, lakes, rivers. Most Indian rivers are polluted by industrial effluents.
- b) Accumulation of sewage: Sewage containing vegetable wastes, fruit wastes, animal excreta, human excreta and organic wastes from factories are released into water sources.
- c) Addition of detergents: Domestic wastes contain a high percentage of detergents. Detergents on reaching water bodies, they cause foaming and reduction in the dissolved oxygen content.
- d) Addition of agricultural wastes: A variety of pesticides and fertilizers used in agriculture which are non-biodegradable are washed away into water sources.

**24. Give reason: Most Indian rivers are polluted by industrial effluents.**

Waste materials from industries containing enormous quantities of chemicals are released into the nearby rivers. Hence most Indian rivers are polluted.

**25. Give reason: Domestic waste has a high percentage of detergents.**

More people are switching over to synthetic detergents than using traditional soap which is biodegradable. Hence the percentage of detergents in domestic waste is increasing.

**26. What is eutrophication? What is it due to? What are its effects?**

The process of increase in the growth of algae in water bodies due to increase of phosphorous is called eutrophication.

Eutrophication is due to high phosphorous content of detergents and fertilizers.

Oxygen content in water bodies decrease due to rapid growth of organisms which consume phosphorous compounds.

**27. How is ground water polluted?**

Pollutants like lead, arsenic and fluoride combine with hydrogen, oxygen, iron and chlorine in water results in poisoning of ground water.

**28. What is meant by thermal pollution? What is its effect?**

The release of high temperature effluents from furnace and boilers of industries directly into water sources is called thermal pollution.

Thermal pollution destroys the aquatic life to the thermal shock.

**29. What is meant by marine pollution? What are the causes for marine pollution?**

The pollution of seas and oceans is called marine pollution. It is caused due to condensing of the pollutants after reaching atmosphere, agricultural runoff, oil seepage from tankers and industrial effluents.

**30. What are the measures to control water pollution?**

- a) Industrial effluents must be treated to remove the pollutants. Toxic chemical substances must be eliminated. Acid and alkalies must be neutralized. Metallic compounds must be precipitated.
- b) Effluents from furnaces must be cooled to room temperature and treated before releasing it.
- c) Sewage water must be treated to remove suspended particles. It must be aerated and then chlorinated to purify water. This can be reused.

**31. What are the steps taken before releasing the industrial effluents into water bodies?**

- a) Industrial effluents must be treated to remove the pollutants.
- b) Toxic chemical substances must be eliminated.
- c) Acid and alkalies must be neutralized.
- d) Metallic compounds must be precipitated.

**32. What are the steps taken before releasing sewage water into water bodies?**

- a) Sewage water must be treated to remove suspended particles.
- b) It must be aerated
- c) Chlorinated to purify water.

**33. Explain the need for treating sewage water.**

Sewage contains human excreta, animal excreta, detergents etc. They contain disease causing microbes. If sewage water is let out directly into water bodies without treating, it spreads water borne diseases.

**34. What are the causes of land pollution?**

Land pollution is caused due to throwing cans, bottles and plastic items. Burning or dumping them into open lands. It is also caused by agricultural runoff containing residues of fertilizers and pesticides. Acid rain also contributes to land pollution.

**35. How does acid rain cause land pollution?**

Acid rain caused by air pollution is also contributing to air pollution by altering the acidity and fertility of soil.

**36. Define noise.**

Noise is defined as any sound which causes unpleasant effect and discomfort to human ears.

**37. What are the main sources of noise pollution?**

- a) Gadgets used in home like mixer and grinder.
- b) Transport vehicles like aircrafts
- c) Commercial and industrial activities,
- d) Audio equipment used in social and public functions.

**38. List the effects of noise pollution.**

- a) Noise pollution directly affects the human nervous system, causing deafness, headache, high blood pressure and heart disorders.
- b) Noise causes behavioural discomforts.
- c) Noise pollution also affect animals

**39. What is meant by ozone depletion?**

The reduction of the ozone in the stratosphere is called ozone depletion.

**40. How is ozone layer getting depleted?**

Depletion of ozone in the atmosphere is due to release of chloro-fluoro carbons (CFC) by refrigerators, air conditioners and aerosols.

**41. What are CFC's? How do they damage ozone layer?**

CFC stands for chloro-fluoro carbons. It is a product of industrial processes involved in the manufacturing of insulating foams, solvents, cooling equipments like refrigerators, air conditioners. It is also found in various kinds of sprays (aerosols).

The ultraviolet rays from the sun break the CFC in the stratosphere into chlorine atoms. Chlorine reacts with ozone and breaks into oxygen.

**42. What is the effect ozone depletion?**

- a) Thinning of the ozone layer allows high levels of UV radiations to reach the earth causing mutations in organisms.
- b) In humans, the incidence of skin cancer and cataract increases.
- c) In plants and animals, it affects growth and physiological functions.
- d) It affects the population ratio of phytoplanktons causing serious imbalance in the ecosystem.
- e) In the atmosphere, it affects the natural balance of gases, particularly affecting the carbon cycle.

**43. What are mutations?**

The sudden change in the genetic material of an organism is called mutation.

**44. What is meant by global warming?**

Rise in the average temperature of the earth's atmosphere and oceans is called global warming.

**45. What is meant by greenhouse effect?**

The increase in the atmospheric temperature due to trapping of heat by some gasses in the atmosphere is called greenhouse effect.

**46. What are greenhouse gases?**

The gases responsible for greenhouse effects are called greenhouse gases.

**47. What is a greenhouse?**

A green house is built of any material like glass or plastic through which sun light can pass. The ground inside gets heated up, warming the air inside. The air continues to heat up because it gets confined within the green house.

**48. Where are greenhouses used?**

Green houses are used in horticulture to provide warm temperature for growing ornamental plants.

**49. Why greenhouse effect is called so?**

The warming effect is similar to what is seen in green house. Hence it is called greenhouse effect.

**50. Name the greenhouse gases.**

Carbon dioxide, oxides of nitrogen, methane and ozone are the greenhouse gases.

**51. What are the consequences of global warming?**

Global warming has resulted in melting of glaciers, causing an increase in the sea level. Flooding of sea water results in submerging of lands.

**52. Give reason: Global warming affects both aquatic and land life.**

Global warming causes melting of glaciers, causing flooding of sea water which in turn results in submerging of land. Hence it affects both aquatic and land life.

**53. How is acid rain formed?**

When oxides of sulphur and nitrogen in the atmosphere combine with water vapour, it forms sulphuric acid, nitric acid respectively. This precipitate as rain, snow or fog.

The main source of the oxides is combustion of fuels in the industries.

**54. What are the effects of acid rain?**

Effects on aquatic life:

Acid rain affects all forms of life.

It affects egg production in aquatic animals. It alters the population ratios.

Effect on vegetation:

It can affect vegetation.

It leaches the nutrients in soil.

The leaves of affected plants develop spots and crack allowing infection.

Effect on monuments and buildings:

It also affects old buildings and monuments.

It damages metals and stone structures.

Effect on human health:

It causes skin allergies and respiratory problems.

**55. Give reason: Acid rain affects population ratio.**

Acid rain affects egg production in aquatic animals hence it alters the population ratio.

**56. Give reason: Acid rain affects vegetation.**

Acid rain makes the soil acidic and leaches the nutrients in soil. It also allows pathogens through cracks in affected plants. Hence acid rain affects vegetation.

**57. Give reason: Taj Mahal is a mute victim of acid rain.**

A large number of industries in the neighbouring areas of Taj Mahal release gaseous pollutants causing the marble to lose its glaze. Hence Taj Mahal is a mute victim of acid rain.

**58. What is meant by radioactive pollution?**

The pollution caused due to emission of protons (alpha particles), electrons (beta particles) and gamma rays is called radioactive pollution.

**59. Mention the two types of radiation and explain.**

The two types of radiation are:

- Ionising radiation: Radiations having high penetration power and cause breakage of macro molecules.
- Non-ionising radiations: Radiations which affect only those compounds which absorb them.

**60. Mention the penetrative power of alpha, beta and gamma particles.**

Type of particles	Penetrative power
Alpha	Blocked by paper, human skin
Beta	Penetrate through skin but blocked by glass or some metals
Gamma	Penetrates skin and damage cells. They cannot be blocked

**61. Mention the source of radioactive pollution.**

- Nuclear power plants
- Nuclear weapons
- Disposal of nuclear wastes
- Use of radioactive isotopes
- Mining and refining of radioactive substance like uranium and thorium

**62. How does radioactive material affect humans?**

Radio active materials react with biological molecules. It can damage DNA, leading to cancer and birth defects.



**Fill in the blanks:**

1. An undesirable change in the physical, chemical and biological characteristics of the environment is called **pollution**.
2. The necessary factor that makes any substance a pollutant is **Human interference**.
3. Oxides of nitrogen released during lightning is an example of **biodegradable** pollutant.
4. An example of **biodegradable** pollutant is **sewage**.
5. Sewage is made harmless by **biological activity**.
6. Pollutants that can be made harmless by quick dilution or conversion are called **biodegradable pollutants**.
7. Pollutants that cannot be made harmless constituents are called **non-biodegradable pollutants**.
8. Global environmental problems are caused due to **long term effects of air pollution**.
9. The phenomenon of increase in the concentration of toxic substances at each trophic level in a food chain is called **biomagnification**.
10. Any human activity that brings about a significant change in the constituents of atmosphere is called **air pollution**.
11. An example of an activity which causes indoor air pollution is **cooking / cleaning**.
12. Waste incineration releases mainly **carbon monoxide**.
13. Any change in physical (smell, colour taste), chemical and biological characteristics of water is called **water pollution**.
14. The process of increase in the growth of algae in water bodies due to increase of phosphorous is called **eutrophication**.
15. Detergents cause a decrease in the **oxygen** content of water.
16. The release of high temperature effluents from furnace and boilers of industries directly into water sources is called **thermal pollution**.
17. According to estimates, every human generates **six** kilogram of trash every day.
18. Any sound which causes unpleasant effect and discomfort to human ears is called **noise**.
19. The unit of measuring sound is **decibels (db)**.
20. Any sound with intensity of beyond **100db** is harmful to human ears.
21. The reduction of the ozone in the stratosphere is called **ozone depletion**.
22. The sudden change in the genetic material of an organism is called **mutation**.
23. Earth's mean temperature is said to have increased by about **0.8°C** since the beginning of this century.
24. Increase in the heat content is **greater** in the oceans than in any other source of energy.
25. **90%** of the possible increase in the heat content of the earth system takes place in **oceans**.
26. The greenhouse gases are carbon dioxide, oxides of nitrogen, methane and ozone.
27. The pH of rain water is **5.6**.
28. The main source of oxides which cause acid rain is **combustion of fuel in industries**.

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