

CHAPTER 7: MAN AND HIS ENVIRONMENT

B. Short Questions Answers

i) What is the effect of light on ecosystem?

EFFECT OF LIGHT ON ECOSYSTEM

Light affects organisms in three ways:

1. Intensity of light,
2. Its duration or photoperiod and
3. Its quality Or Type (wave length).

1. Intensity of Light:

- In plants intense light may destroy the chlorophyll.
- It also affects opening and closing of the stomata.
- In animals light affects development of pigments.

2. Exposure time of light (Photoperiod):

- Light is also necessary for vision.
- Duration of light (photoperiod) affects starts of certain biological processes.
- Making Vitamin D in human being.

3. Quality of Light:

- Out of seven colors of visible light (electromagnetic spectrum), chlorophyll absorbs only red and blue light for photosynthesis.
- Most of the light reaching the earth is converted to heat and thus light also maintains the temperature of the earth and atmosphere in the ecosystem.

ii) Which one is the first trophic level of ecosystem and how?

TROPHIC LEVELS

The steps of transfer of energy rich food are called trophic levels.

FIRST TROPHIC LEVEL OF ECOSYSTEM

PRODUCERS:

- Producers always occupy the first trophic level in any food chain because only producers have the ability to trap solar energy with the help of chlorophyll and synthesis their own food.
- The producers produce food for themselves and other organisms of ecosystem.
- They are primary source of energy for other organisms.
- All members of community depend, directly or indirectly on the producers for their food and energy.

iii) What do we mean by nitrogen fixation and how it occurs in an ecosystem?

NITROGEN FIXATION:

"Conversion of atmospheric free nitrogen gas into soluble nitrogen compounds (nitrates) is called nitrogen fixation."

Nitrogen Fixation Occurs In Ecosystem:

The atmosphere contains about 78 percent nitrogen gas. It is an inert gas and the organisms cannot use it directly. Therefore, nitrogen is first changed to soluble nitrogen compounds such as nitrates (NO_3) which the plants can absorb from the soil.

iv) What is interaction?

INTERACTION IN ECOSYSTEM

The organisms in an ecosystem not only interact with their physical environment but also with each other. These interaction maintain balance in growth and population. These interactions may be beneficial or harmful.

Define symbiosis and also describe its types?

SYMBIOSIS

Generally the symbiosis is defined as an association between two living organisms of different species for mutual benefit or in which one partner gets the benefit and the other is neither benefited nor harmed.

In other words none of the two partners is harmed.

Types Of Symbiosis:

There are three types of symbiosis

1. Parasitism:

Parasitism is an association between two living organisms in which one lives in or on the body of the other and derives nourishment from it..

They have rapid rate of reproduction.

2. Commensalism:

It is an association between two living organism of different species in which one is benefited and the other is not affected, that is it is neither benefited nor harmed.

3. Mutualism:

It is an association between two species of living organisms for mutual benefit.

The two partners are dependent on each other for their survival and growth.

v) What is pyramid of number?

PYRAMID OF NUMBERS

The pyramid of numbers was advanced by Charles Elton in 1927. It is define as:
"A pyramid of numbers is a graphical representation of members of population in an area at different in trophic level."

It is an upright pyramid in light of the fact that in an ecosystem, the producers are always more in number than other trophic levels.

vi) What is greenhouse effect?

GREEN HOUSE EFFECT

Green House Gases

CO₂ and methane produced during burning of fossil fuels in urban areas are generally called greenhouse gases.

Global Warming OR Green House Effect:

Due to excessive burning of fossil fuels, the amount of CO₂ in atmosphere becomes abnormally high. CO₂ and methane if produced in high quantity in atmosphere are accumulated below the ozone layer, which do not allow heat energy of sun to reflect back in space. As a result, heat remains within the earth's atmosphere this phenomenon is called global warming or greenhouse effect.

vii) What is algal bloom and how it destroy the life of an aquatic ecosystem?

EUTROPHICATION OR ALGAL BLOOM

Growth of algae with very high rate due to increase in phosphorous and nitrogen compounds is called algal bloom or eutrophication. They accumulate in water reservoirs and promote algal growth up to dangerous level i.e. algal bloom.

Effects on Aquatic ecosystem:

- Algal bloom when floats on water surface spoil fishing, swimming and recreational qualities of water.
- As the algae die, the activity of decomposers increase and they consume more and more oxygen. Deficiency of oxygen results in massive death of useful organisms such as fishes.

viii) What measure can be taken to control water pollution?

CONTROL OF WATER POLLUTION

- Public awareness at all levels is important. It should be through social media, political leaders, institution from pre-primary level.
- Strict legislation and implementation is required on sewage treatment and industrial recycling processes.

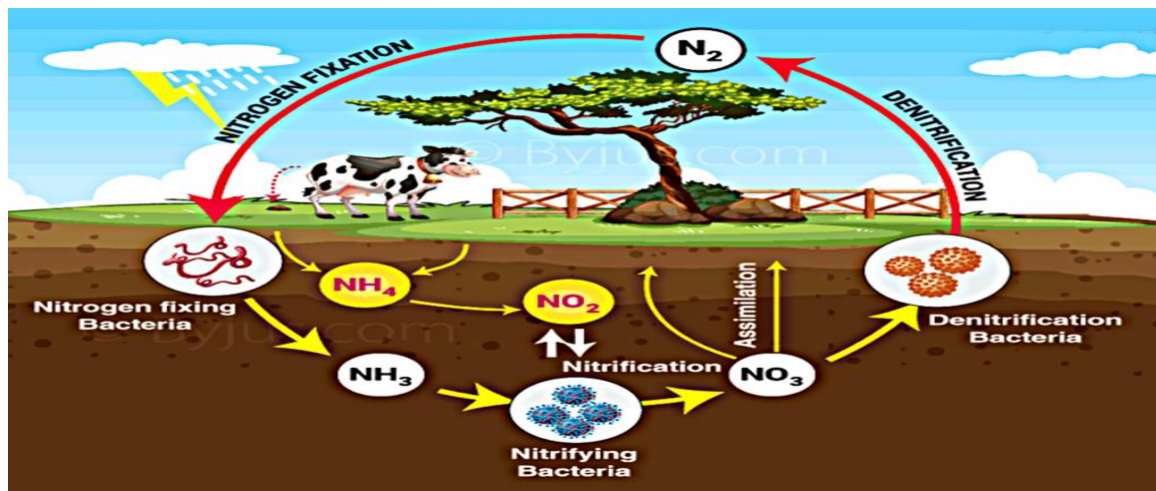
- No industrial and agricultural waste should be added to water bodies before complete treatment.

ix) Write down the name of some endangered mammals of Pakistan.

ENDANGERED MAMMALS OF PAKISTAN

- Punjab Urial
- Markhor
- Snow Leopard
- Asia sandpit green turtle
- Indus river dolphin
- Bear of Deosai

x) Draw the diagram of nitrogen cycle.



xi) Write down the name of some endangered birds of Pakistan.
ENDANGERED BIRDS OF PAKISTAN:

- Siberian Crane
- Falcon
- Cheer Pheasant
- Chacor
- Long Billed Vulture
- Red Avadavar

xii) Illustrate acid rain and its effect?

ACID RAIN

Acid rain includes any form of precipitation with acidic components, such as sulphuric or nitric acid that fall to the ground from the atmosphere in wet or dry forms. This can include rain, snow, fog, hail or even dust that is acidic.

Effect:

The acid destroy soil, micro-organisms of soil, skin of animals, building material.

xiv) What is meant by depletion of ozone layer?

DEPLETION OF OZONE LAYER

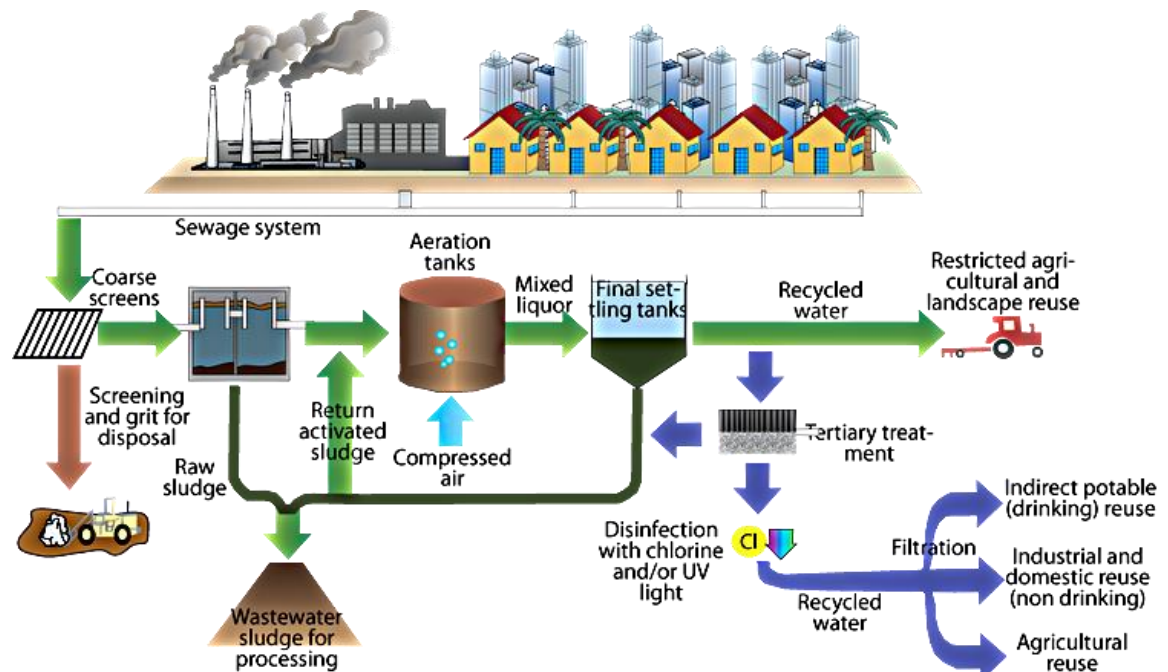
Scientist have found ozone layer is gradually depleting (getting thin) due to chloro fluoro carbon (CFC), as they react with ozone and convert it into O_2 .

The CFC used as propellant in pressurized aerosol, foaming agent, refrigerators etc.

Each one atom of chlorine converts more than 100000 molecules of ozone O_3 to Oxygen O_2 .

xv) Draw diagram for sewage treatment?

SEWAGE TREATMENT



Extensive Response Questions

Q.No1:

Define Environmental Biology, ecology and habitat. Also discuss the levels of ecological organization.

ENVIRONMENTAL BIOLOGY

The scientific study of environment, ecology, evolution and global change with in a combined form is called environmental biology.

ECOLOGY

Ecology is the scientific study of different relationships with each other and with their non-living environment which supports them.

HABITAT

The area where an organism lives is called its habitat. It may be on land, in water or in the air.

LEVELS OF ORGANIZATION OF ECOLOGY:

In ecology the level of organization ranged from organism to biosphere. These levels of study are:

1. Population
2. Community
3. Ecosystem
4. Biomes
5. Biosphere

1. Population:

A group of organisms belongs to the same species lives and interacts in a particular area is known as population.

Example:

A fresh water ponds includes a population of Hydrilla, a population of frogs. A population of deer family on land etc.

2. Community

It consists of a group of populations or organisms (plants and animals) that lives in a particular area or habitat and belonging to different species which interact with each other is called community.

Example:

A fresh water ponds includes a population of Hydrilla, a population of frogs, insects, worms, rohu and many other kinds of animals.

3. Ecosystem

Members of community interact with each other as well as with their nonliving (abiotic) environment. During this interaction energy is also transferred from one to another level. So the area where these all interactions occur called Ecosystem.

Example:

An ecosystem may be as small as dead truck tree, a puddle or as large as an ocean or forest.

4. Biosphere:

Life is supported on earth within a thin envelop of air, water and soil which is called biosphere.

Biosphere consists of the earth from its surface to about few meter depth, all the water and the gaseous capsule surrounding the earth.

Example:

All ecosystems on earth combine and constitute the giant ecosystem, the biosphere.

5. Biomes:

The biospheres are divided into sub levels which are called biomes.

Any bio-geographical region recognized by specific vegetation or climate called Biome.

Example:

Freshwater ponds, Grasslands, Marine, Desert etc.

Q.No.2: Explain the components of ecosystem in detail. Or Describe abiotic factors of an ecosystem and biotic factors of an ecosystem.

ECOSYSTEM

The term 'ecosystem' was first proposed by Tansley in 1935, where 'Eco' means the environment (house) and 'System' means an interacting area.

"Members of community interact with each other as well as with their nonliving environment. During this interaction energy is also transferred from one to another level. So the area where these all interactions occur called Ecosystem."

COMPONENTS OF ECOSYSTEM

An ecosystem is made up of two types of components.

1. Non-living or Abiotic Components
2. Living or Biotic Components

1. ABIOTIC COMPONENTS OF ECOSYSTEM

Abiotic components of an ecosystem consists of Physical aspects of its surroundings which influence upon the biotic components. Many abiotic components affect an ecosystem.

Some important factors are light, temperature, water, soil and air. All these work in interacting manner.

LIGHT:

- Light is the most vital factor, without it life cannot exist.
- It is ultimate source of energy for every ecosystem and plays an important role in the lives of both plants and animals.
- Plants convert light energy into chemical energy by the process of photosynthesis. This chemical energy is stored in the form of food which is needed by every living things.

(ii) Temperature:

- Another important abiotic factor affecting an ecosystem is temperature.
- The flora and faunas change according to the temperature. Temperature of water usually does not show vast variations therefore aquatic life possesses very few adaptations related to temperature.
- Many birds and few mammals migrate or hibernate in winter.
- Temperature also effect the enzyme activities of metabolic reactions.

(iii) Water:

- Water is most important ecological factor because it is essential for life and directly effects the physiology distribution and structural adaptations of both animal and plants.
- It is the major part of protoplasm.
- It acts as a limiting factor in terrestrial ecosystems.
- The availability of water in an ecosystem depends on factors such as rain, snow, type of the soil, kind of vegetation etc.
- Water is the raw material for photosynthesis and also plays part in many vital biochemical reactions.

(iv) Soil:

- The upper layer of earth crust is called soil.
- It contains particles of varying size and decomposed organic material by microorganism which is called humus.
- Humus enriches the soil and increases its water and air holding capacity.
- Plants depend upon soil for their growth.
- The flora and fauna in an ecosystem depends upon the fertility of soil.

(v) Air:

- Air plays a vital role in smooth running of ecosystem.
- Air is the gaseous envelope which surrounds the earth.
- Carbon dioxide is the main requirement for photosynthesis, it produce primary product i.e. carbohydrates.
- Humidity is the quantity of H₂O vapours in the air and controls the rate of evaporation of H₂O vapours and transpiration in plants.
- The composition of air controls all the other abiotic factors of environment.

BIOTIC COMPONENTS OF AN ECOSYSTEM

The living organisms which interact in an ecosystem are called biotic component. These include producers, consumers and decomposers.

(i) Producers:

- All living organisms which can trap and convert energy into food molecules are called producers.
- Producers always occupy the first trophic level in any food chain
- They produce food for themselves and other organisms of ecosystem.

Example:

These are photosynthetic bacteria, algae and plants.

(ii) Consumers:

- Animals and all other organisms which cannot make their own food are called consumers.
- They get energy and food from producers directly or indirectly.
- Types Of Consumers:
- On the basis of feeding level the consumers are categorized into three types.

(a) Primary consumers

The consumers which get energy and food directly from producers are called Primary consumers.
They are basically herbivores.

Example:

A grasshopper or caterpillar feeding on leaves of plants are primary consumers.

(b) Secondary consumers:

The consumers which directly feed on primary consumers i.e. get energy and food from primary consumers are called secondary consumers.
They are basically carnivores.

Example:

A bird is a secondary consumer gets its energy and food when it eats grasshopper or caterpillar.

(iii) Tertiary consumers

The consumers which eat the secondary consumers to get energy and food are called tertiary consumers.

They are basically carnivores.

Example:

An eagle which eats the small bird, which has already eaten grasshopper.

(iv) Decomposers:

- The microorganisms which break down complex food molecules of dead organisms are called decomposers.
- They recycle the nutrients because they return them through decomposition.

Example:

These include bacteria and fungi.

Q.NO.3: Explain the flow of energy in an ecosystem as a non-cyclic process.

OR Describe pyramid of energy in an ecosystem.

FLOW OF ENERGY IN ECOSYSTEM AS A NON-CYCLIC PROCESS:

The energy flow in the ecosystem is one of the major factors that support the survival of such a great number of organisms.

During the process of energy flow in the ecosystem:

- Plants being the producers (phototrophs) absorb sunlight with the help of the chloroplasts and convert it into energy rich organic food molecules in the process of photosynthesis.
- Part of this energy is transformed to the herbivores consumers (primary consumers) when they eat plants (producers) as food in the food chain. When these herbivores consumers (primary consumers) are ingested by carnivores (secondary consumers), they transfer this energy to secondary consumers which in turn form the meal of tertiary consumers.
- Finally, the energy is transferred to next level, the tertiary consumers (carnivores). Thus the energy flow is unidirectional in nature.

TROPHIC LEVELS

The steps of transfer of energy rich food are called trophic levels.

- The producers (plants) represent the first trophic level.
- Herbivores (primary consumers) present the second trophic level.
- Primary carnivores (secondary consumers) represent the third trophic level.
- Top carnivores (tertiary consumers) represent the last level.

FOOD CHAIN

The series of energy transfer from one trophic level to another is by eating or being eaten up is called food chain.

10% LAW:

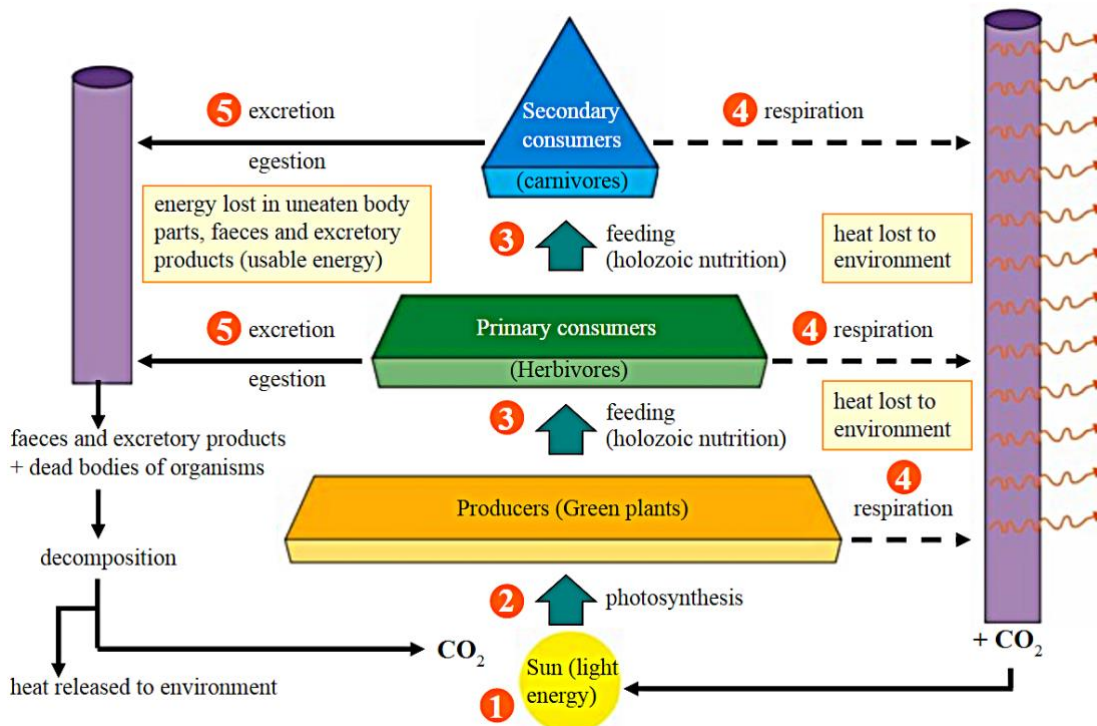
According to this law:

"Only 10 percent of energy is transferred from one trophic level to the other; rest is lost into the atmosphere."

At each trophic level not all but a small amount of energy is transferred to the next level where it is stored as plant material or animal flesh. More than half of the energy is lost as heat.

PYRAMID OF ENERGY:

The reduction in the transfer of energy at various level in an ecosystem is expressed in the form of a pyramid called the pyramid of energy.



Q.No.4: Explain the flow of materials in ecosystem as a cyclic process.

The organic and inorganic materials flow in two ways in an ecosystem. These ways are interlinked and cyclic. They are:

1. Food chain and food web
2. Biogeochemical cycle

FOOD CHAIN AND FOOD WEB

FOOD CHAIN

Definition:

"The transfer of food material from producers through a series of organism i.e. producers to consumers with repeated eating and being eaten is called food chain."

Explanation:

- In ecosystem, the flow of food materials progress through food chain in which one steps follows another.
- Simple food chains occur rarely in ecosystem.

For example:

In Grassland ecosystem, The grass is eaten by grass hopper, locust and rabbit etc. These in turn is eaten by sparrows, lizards and jackals, respectively are secondary consumers. Sometimes these secondary consumers are eaten by hawk.

FOOD WEB

Definition:

"In a given ecosystem various food chains are linked together and interact with each other to form a complete network called food web."

Explanation:

An organism drives its food from multiple sources and the same organism is eaten up by several organisms of higher trophic levels or an organism may feed upon several different kinds of organisms of lower trophic level.

BIOGEOCHEMICAL CYCLES

Definition:

"Biogeochemical cycles refer to the flow of such chemical elements and compounds continuously between organisms and the physical environment."

CHARACTERISTICS OF BIOGEOCHEMICAL CYCLES:

- A biogeochemical Cycle has the following characteristics:
- Movement of nutrient elements from environment to organism and back to environment
- Involvement of biological processes
- A geochemical reservoir
- Chemical changes

All biogeochemical cycles are closely interlinked with water cycle and energy flow in ecosystem. Following are some important biogeochemical cycles:

1. Carbon-Oxygen Cycle
2. Nitrogen Cycle

Q.No.5: Describe carbon-oxygen cycle as biogeochemical cycle in detail with diagram.

CARBON-OXYGEN CYCLE

- All the life in the earth is based on carbon. It is needed for the formation of proteins, carbohydrates, fats and many other substances that make up living things.
- The carbon comes from carbon dioxide which is found in atmosphere.
- Two important processes, the respiration and photosynthesis help a lot to run the carbon-oxygen cycle.

Respiration:

Consumes oxygen for the combustion of food for release energy. During this process carbon dioxide is produced and released in the atmosphere.

Photosynthesis:

Plant takes this CO₂ from air and convert it into carbohydrates by photosynthesis and releases O₂. Carbon in this form passes into a food chain.

- Animals get carbon by eating plants and animals. The amount of CO₂ in the air stays the same because it is returned to the air as fast as plants take it in.
- Decomposers set the CO₂ free from bodies of dead organisms. It is also returned to air by combustion that is burning of wood and other organic fuel like coal, petrol and gas etc.
- Thus the balance is maintained.

Q.No.6: Describe nitrogen cycle as biogeochemical cycle in detail with diagram.

NITROGEN CYCLE

The nitrogen is an essential part of protoplasm, proteins, nucleic acids, chlorophyll etc and is therefore, necessary for living organisms. The exchange of nitrogen between soil and atmosphere and its circulation through bodies of living organisms takes place through inter-related processes known as nitrogen cycle.

This cycle consist of three steps:

1. Nitrogen fixation
2. Nitrification
3. DE nitrification

NITROGEN FIXATION:

"Conversion of atmospheric free nitrogen gas into soluble nitrogen compounds (nitrates) is called nitrogen fixation."

Nitrogen Fixation Occurs In Ecosystem

The atmosphere contains about 78 percent nitrogen gas. It is an inert gas and the organisms cannot use it directly. Therefore, nitrogen is first changed to soluble nitrogen compounds such as nitrates (NO₃) which the plants can absorb from the soil.

Source of Nitrates

The following are the sources of nitrates for living organisms.

Nitrogen Fixation by Thunderstorm:

The atmospheric Nitrogen combines with oxygen during lightning to make certain compound which ultimately form nitrates and reach to soil by rain water.

Nitrogen Fixation by Living Organisms:

The second source to fix atmospheric Nitrogen are three types of bacteria.

a) The first group lives in water are called cyanobacteria. They are photosynthetic.

b) Second group lives in soil.

c) Third group lives in roots of certain leguminous plants.

These bacteria which help in nitrogen fixation are called nitrogen fixing bacteria.

NITRIFICATION

Process where nitrogenous compounds of living organisms converts into nitrates is called Nitrification.

It is also performed by microorganisms who live in soil. These nitrates are reabsorbed by plants and the nitrogen cycle starts again. Protein of dead animals and plants, the excretory waste is decomposed and the nitrates are recycled.

DENITRIFICATION:

- The process of converting nitrogenous compounds into free nitrogen is called denitrification.
- It mostly takes place by special bacteria which lives in anaerobic condition of soil. These bacteria called denitrifying bacteria.
- These bacteria breaks ammonia and nitrates back into free nitrogen, which is released in air so as to complete the cycle and to keep the nitrogen balance in atmosphere.

Q.NO.7: What do you know about ecological pyramids?

Ecological Pyramids

Definition:

"Presentation of number of individuals or amount of biomass or energy in various trophic levels from lower to higher level are called ecological pyramids."

Two pyramids are

1. Pyramid Of Numbers:

Definition:

"Graphical representation of member of population in an area at different trophic levels is called pyramid of number."

It is an upright pyramid in light of the fact that in an ecosystem, the producers are always more in number than other trophic levels.

For example:

- The grasses sit at the lowest trophic level or the base of the number pyramid because of their abundance.

- The primary consumer, such as a grasshopper, occupies the next higher trophic level. Grasshoppers are fewer in number than grass.
- The next trophic level is a primary carnivore, such as a rat. There are fewer rats than grasshoppers because they consume grasshoppers.
- Secondary carnivores, such as snakes, occupy the next higher trophic level. Snakes feed on rats.
- Snakes are eaten by hawks, which occupy the highest trophic level and are the least in number.
- This expression is also expressed in the form of pyramid known as pyramid of number.

Pyramid Of Biomass

Definition:

"The pyramid that shows the total mass of dry organic matter per unit area of organism at each trophic level is called pyramid of biomass."

It shows that each higher feeding level contains less biomass than the previous trophic level. It results from energy loss in a food chain at each trophic level.

Q.No.8: Define ecological balance, its importance and effects of human activity on ecosystem?

ECOLOGICAL BALANCE:

"Ecological balance is a term that describes how ecosystem is organized in a state of stability where species exist with other."

EFFECTS ON ECOLOGICAL BALANCE:

Ecological balance is disturbed by either natural disasters or by human activity.

EFFECTS OF HUMAN ACTIVITY ON ECOLOGICAL BALANCE:

The modernization and advancement of science by man has affected the ecological balance to a great extent. The modern man is exploiting natural resources at an alarming rate which is adversely damaging environment. Some major aspects are discussed below.

POPULATION GROWTH

Population growth is the increase in the number of humans on Earth.

- Increasing the extraction of resources from the environment.
- Poor distribution of food resulting to hunger and deaths.
- Shortage in medical facilities and services.
- Problems with power shortage and distribution.

URBANIZATION

Urbanization has also emerged as one of the basic problem over the years.

- Increase in pollution of air, water and soil.
- Increase in social evils such as drug abuse, looting, arson, kidnapping, dacoities, religious conflicts, ethnic clashes, linguistic riots.

GLOBAL WARMING OR GREEN HOUSE EFFECT

Due to excessive burning of fossil fuels, the amount of CO₂ and methane produces which are generally called greenhouse gases. The possible effects of global warming are:

- Melting of the polar ice and glaciers at high rate which in turn would raise the sea level flooding vast coastal areas.
- Early melting of snows in the mountains would flood large areas of farmland.
- Warming of atmosphere can cause heavy rains and strong hurricanes and storms.

ACID RAIN

Due to urbanization and industrialization more fuel burn, more acids are used in industries, as a result of these consumptions more CO₂, SO₂, NO₂ are liberated in air from the chimneys. When rain falls through these polluted air H₂O react with these gases in air and produce carbonic acid, sulphuric acid and nitric acid.

DEFORESTATION

Deforestation is when forests are destroyed by cutting trees (logging) and not replanting them.

Direct causes of deforestation are:

It effects the ecosystem in the following ways:

- Climate Imbalance and Climate Change.
- Increase in Global Warming.
- Increase in Greenhouse Gas Emissions.
- Soil erosion.
- Floods.
- Declination of annual rainfall.
- Loss of the fertility of the soil.
- Wildlife Extinction and Habitat Loss.
- The Decline in Life Quality of People.

Q.No.10: What is pollution? Describe its classification.

POLLUTION

"Any undesirable change in the physical, chemical or biological characteristics of environment (air, land, water and soil), which may or will harmfully affect human life, plants, animals or industrial processes, living conditions and cultural assets."

CLASSIFICATION OF POLLUTION:

Pollution is classified into two categories:

i) MATERIAL POLLUTION:

where some material or substance become excessive in environment; like air, water or soil pollution.

ii) NON-MATERIAL POLLUTION:

where material does not increase but environment disturb or become unbearable to live, i.e. noise, heat or radiation pollution.

Q.No.11: What is pollutants? Name some common pollutants.

POLLUTANTS

All those substances that cause pollution called pollutants.

COMMON POLLUTANTS

Common pollutants are:

- Deposited matter such as soot, smoke, tar, dust and grit.
- Gases like SO₂, CO, CO₂, NO₂, CL₂, O₃ etc.
- Chemical compounds like aldehyde, arsines, hydrogen fluoride, chloro fluoro methane, phosgene, detergents etc.
- Heavy metals like lead, mercury, iron, zinc etc.
- Economic poison like herbicide, fungicide, insecticide etc.
- Fertilizers.
- Sewage.
- Radioactive substances.
- Noise and heat.

Q.No.12: Explain air pollution its causes and effects. Also list the ways to control it.

OR Describe different types of hazardous effects caused by air pollution.

AIR POLLUTION

When amount of solid waste or concentration of gases other than oxygen increases in atmosphere it is called air or atmospheric pollution.

CAUSES:

- The Burning of Fossil Fuels like coal gas in industries.
- Transport industry or Automobiles, electrical power plant use coal, gas diesel or petrol.
- Indoor Air Pollution.
- Wildfires.
- Microbial Decaying Process.
- Open Burning of Garbage Waste.
- Construction and Demolition.
- Heating and cooking plants.
- Industrial emission in the form of smoke, carbon mono-oxide (CO), carbon dioxide (CO₂), sulphur oxide (SO₂), nitrogen oxide (NO₂), chloro flouro carbon (CFC) etc.

EFFECTS:

- Acid rain.
- Green house effect or global warming.
- Depletion of ozone which means that CFC is gradually depleting (getting thin) the O₃ which is a protective layer in upper atmosphere against the ultraviolet radiations of sun.

CONTROL OF AIR POLLUTION:

Air pollution can be controlled by following ways:

Use of proper filters

Industrial air pollutants should be passed through filters and other devices. So in this way particulates matter is removed before they release in air.

Use of solar cooker

Industry should use solar cooker or bio-gas producing units.

Environment friendly fuels:

Use lead free fuels, Sulphur free fuels, use of CNG gases.

Afforestation:

Development of new forest or plantation. Forest use excessive CO₂, plants also absorb other air pollutants.

Q.No.13: Explain water pollution its causes and effects. Also list the ways to control it.

WATER POLLUTION

Any contamination of fresh water or marine is called water pollution.

CAUSES:

The main cause of water pollution is human activity which pollutes streams, canals, lakes, rivers and seas. These pollutants affect the aquatic organism and quantity of water which directly and indirectly effect the life of human.

Major sources of water pollution are:

i. *Organic Pollutants:*

Domestic sewage, agriculture run off, organic waste from breweries, bacteria, milk dairies, sugar mills, hotels etc.

ii. *Chemical Pollutants:*

Pesticides, insecticides, fungicides, herbicides, detergents, heavy metals, acid, mine waste, oil and oil dispersants, radioactive material etc.

iii. *Thermal Pollutants:*

Effluents from electric power plants or nuclear reactor plants.

iv. *Siltation:*

Deposition of soil and sand in the bottom of water reservoirs which raise the water levels and decrease water holding capacity. At last this silting cause floods.

EFFECTS:

- Contaminated water becomes unfit for consumption by humans and cattle.
- It results in drastic reduction of fish population.
- Water pollution results in increased cases of water borne diseases; like cholera, diarrhea, jaundice, etc.

Q.No.14: Explain soil pollution its causes and effects. Also list the ways to control it.

SOIL POLLUTION

Soil pollution is defined as the presence of toxic chemicals (pollutants or contaminants) in soil, in high enough concentrations to pose a risk to human health and the ecosystem.

CAUSES:

The pollution of soil has resulted from a number of human activities related to utilization of land resources.

- Mining, excavation of soil for bricks, cement making and construction of roads, dams, building etc.
- Dumping of solid waste in open space have reduced soil resources.
- Deforestation for building and industries.
- Over grazing by cattle of domestic use have destroyed the properties of soil.
- Excessive use of fertilizers, pesticides and poor drainage system.

EFFECTS:

- Pakistan is facing a massive problem of water logging and salinity due to improper canal system.
- Over grazing and deforestation leads to most serious problem of soil erosion by wind and water.
- 24 million area exposed to severe environmental threats, suffering from various kind of degradation.

CONTROL:

- Recycling of solid waste.
- Proper dumping of solid waste.
- Plantation, development of forest.
- Development of pasture and meadows for grazing of animals.
- Proper irrigation system like drip system.

**Q.No.15: What do you understand by the term conservation?
State at least five plans of government of Pakistan to conserve nature.**

CONSERVATION

Conservation is a plan of avoiding the unnecessary use of natural materials or resources or a careful preservation and protection of natural resources by planned management to prevent exploitation of, destruction or negligence.

TYPES OF RESOURCES:

There are basically two types of resources:

1. ***Renewable resources:***

The sources that can be used again and again are called renewable resources. Air, water, food, land, forest, live-stock, wildlife, are renewable.

2. ***Non- renewable resources:***

The resources that cannot be used again and again are called non-renewable resources.

NEED TO CONSERVE:

- The sources of earth are limited and are fast declining. It is therefore necessary to use these resources in a balanced and planned way. Overuse of these resources affect natural recycling process. Therefore, these natural resources should be conserved by the process of conservation.
- We can also conserve non-renewable resources. To do so we have to find alternative ways to slow down the dependency at one resource, just like petrol for automobiles or metals.
- We have to adopt the old principle of Reduce, Reuse and Recycle.
Reduce means found ways to reduce the wastage like water usage and power usage.
Reuse means to develop methods to reuse the resources again and again.
Recycle means material like paper, glass, metal, plastic etc. can be recycled.