

ALPHA COLLEGE OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

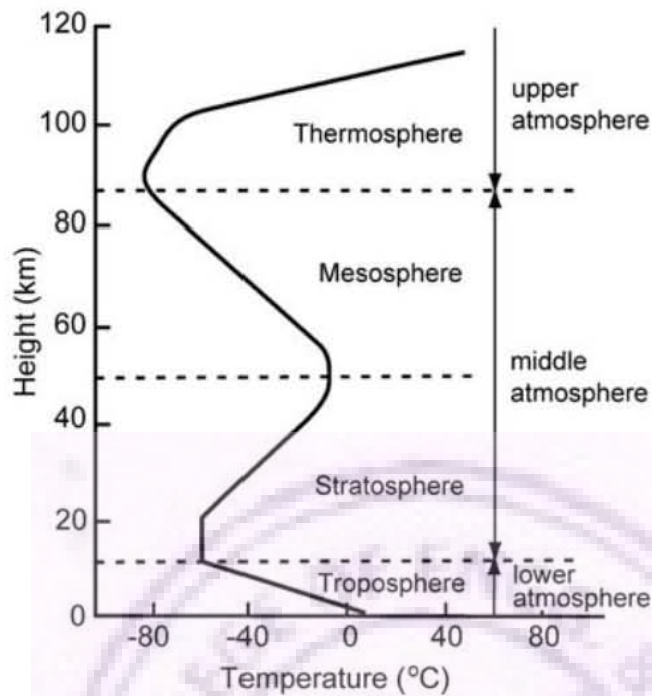
ENVIRONMENTAL STUDIES(2110007)

1. Short note on structure of atmosphere. (Jan-10, july-11)
2. Explain Impacts of human on environment. (Jan-10,mar-10,Dec-11,May-12,)
3. Write in brief about environmental education. (June-9,jan-10,dec-10,june-13)
4. Classification of ecology. (Jan-10,july-12,dec-11)
5. Explain components of ecosystem. (June-09,mar-10,july-11)
6. Explain Energy flow in ecosystem. (June-09,jan-11,june-11)
7. Short note on ecological pyramids. (Jan-10,mar-10,june-10,july-1)
8. Explain carbon cycle with figure. (June-09,sep-09,july-11)
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14. Explain importance of forests (Dec-08,mar-09,jan-10)
15. Write in brief about causes of deforestation? (Mar-09,jan-10,jan-11,jan-13)
16. What is malnutrition or malnourishment? (May-12,jan-13)
17. Explain reasons for over population. (Jan-10,dec-11,may-12)
18. Short note on eutrophication (Sep-09,dec-10,jan-11,dec-11,jan-13)
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1. Short note on structure of atmosphere. (Jan-10, July-11)

ANS :

- ॐ Atmosphere can be divided in five parts: Troposphere, Stratosphere, Mesosphere, Thermosphere, Exosphere
- ॐ **Troposphere:**
It is the lower portion of atmosphere extends up to 8-10 km from the surface of earth. Temperature in this region decrease at the rate of $5-7^{\circ}\text{C}$. There are strong vertical air movements, which are responsible for complete mixing of gases.
- ॐ **Stratosphere:**
It is the upper layer of troposphere. It exists up to 50-55 km. In this layer temperature increase with increase in height. At nearer to 20 km, there is ozone layer.
- ॐ **Mesosphere:**
It is the layer above the stratosphere. It extends up to 80 km. Here temperature decreases with increase in height.
- ॐ **Thermosphere:**
In this layer temperature increases rapidly with increase in height. There is absorption of solar energy in this layer. It also consists of charged particles.
- ॐ **Exosphere:** It extends up to 2000 km above the earth. It has very high temperature. It consists of hydrogen gas in ionized state, so it is also called empty layer.



2. Explain Impacts of human on environment. (Jan-10,mar-10,Dec-11,May-12,)

ANS :

- Human is the only living organism capable of modifying its surrounding environment according to the need.
- At first man started hunting animals and cutting trees for his basic needs, gradually with time he started cultivating food grains and for that he started cutting forest and converting them in to agricultural fields.
- To increase comfort he started disturbing each and every component of environment.
- Large scale deforestation, increasing in quantity of carbon dioxide due to burning of forest, grass, endangering some of the species of organism. It results in increasing in pollution. But up to that time amount of pollution was within the assimilative capacity of environment.
- With start of industrial revolution the total scenario changed. The use of fossil fuel for generation of power, for running vehicles, many industries started to produce the products which increased the living standard of people.
- Major environmental issues arising due to human activities are global warming, acid rain, ozone layer depletion and population explosion.

3. Write in brief about environmental education. (June-9,jan-10,dec-10,june-13)

ANS :

- ⇨ Environmental education is the study of the factors influencing ecosystems, mental and physical health, living and working conditions and pollution.
- ⇨ Environmental education has very important role to play in dealing with the global and local issues of environment. It is important in developing awareness about the challenges which would arise due to man handling the environment and understanding it in better way.
- ⇨ Main objectives of environmental education are to increase awareness and sensitivity to total environment, to increase the knowledge of environment, to improve attitude towards environment, and to provide motivation for environment protection.
- ⇨ For Environmental education the major principles are
 1. It considers environment in totality
 2. Environmental hazards can be controllable and every citizen has a moral obligation and responsibility towards this.
 3. Education must be given to all sections of society.
 4. Help learner to discover the systems and causes of environmental problems.
 5. Concerns of environment are concerns of several agencies and everybody should work together.

4. Classification of ecology. (Jan-10,july-12,dec-11)

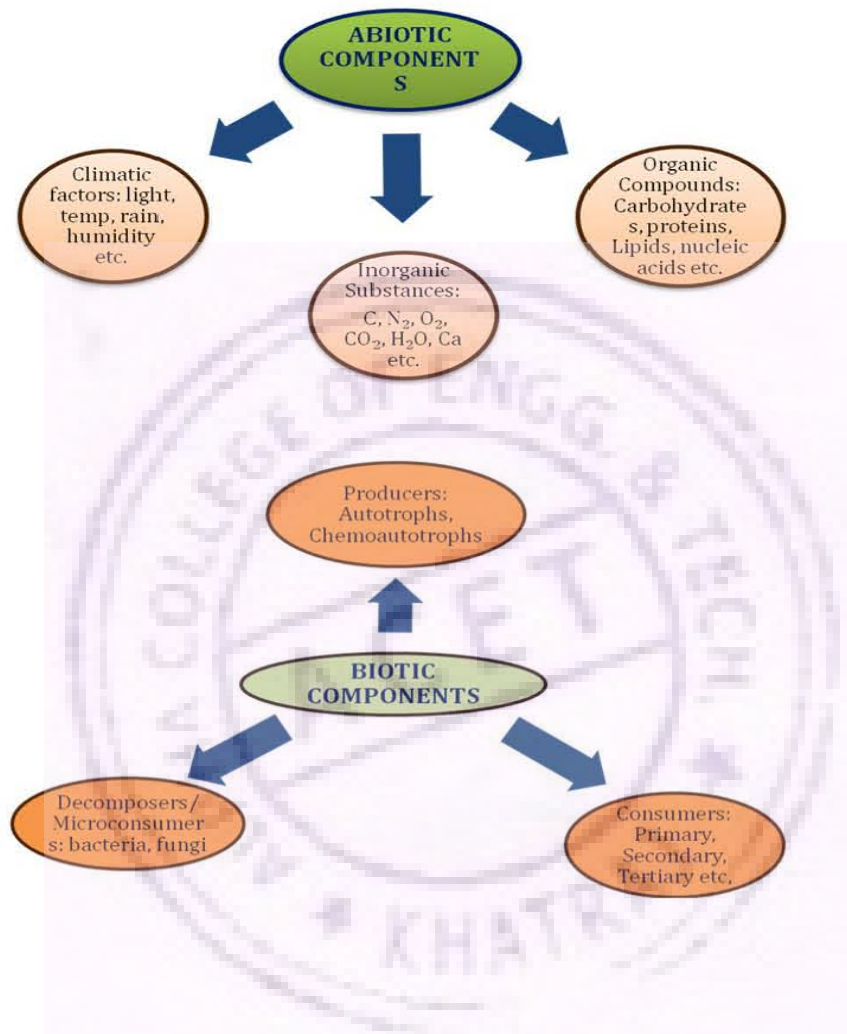
ANS :

- ⇨ Ecology can be divided in to
 - Autecology:** It deals with study of individual organism or an species.
 - Synecology:** It deals with study of group of organism or species which are associated together as a unit.
- ⇨ **Ecology can be further divided three parts:**
 1. **Based on taxonomic affinities:** It means division of ecology in plant ecology and animal ecology.
 2. **Based on habitats:** it means division of ecology in to Aquatic ecology(Marine Ecology, Fresh water Ecology, Stream Ecology) and Terrestrial ecology(Grass land Ecology, Forest Ecology, Desert Ecology)
 3. **Based on level of organization:** It deals with population Ecology, Community Ecology, and Ecosystem Ecology.

5. Explain components of ecosystem. (June-09,mar-10,july-11)

ANS :

- || Two major components: Abiotic components(non living) and biotic components (living)

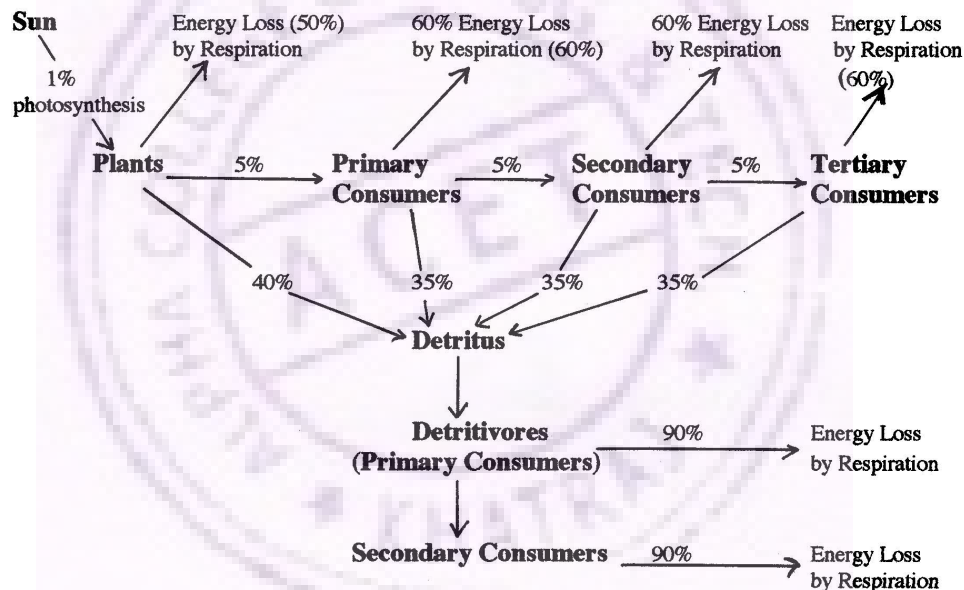


6. Explain Energy flow in ecosystem. (June-09,jan-11,june-11)

ANS :

- || Ecosystems maintain themselves by cycling energy and nutrients obtained from external sources.
- || At the first trophic level, primary producers (plants, algae, and some bacteria) use solar energy to produce organic plant material through photosynthesis. Herbivores—animals that feed solely on plants—make up the second trophic level. Predators that eat herbivores comprise the third trophic level; if larger predators are present, they represent still higher trophic levels.

- || Organisms that feed at several trophic levels (for example, grizzly bears that eat berries and salmon) are classified at the highest of the trophic levels at which they feed.
- || Decomposers, which include bacteria, fungi, molds, worms, and insects, break down wastes and dead organisms and return nutrients to the soil.
- || On average about 10 percent of net energy production at one trophic level is passed on to the next level. Processes that reduce the energy transferred between trophic levels include respiration, growth and reproduction, defecation, and nonpredatory death (organisms that die but are not eaten by consumers).
- || The nutritional quality of material that is consumed also influences how efficiently energy is transferred, because consumers can convert high-quality food sources into new living tissue more efficiently than low-quality food sources.



7. Short note on ecological pyramids. (Jan-10,mar-10,june-10,july-1)

- || Graphical representation of trophic structure and function of ecosystem, starting with producers at the base and successive trophic levels forming the apex is known as ecological pyramids.

1. Pyramids of numbers:

It depicts the number of individual organisms at different trophic levels of food chain. Successive links of trophic structure decrease rapidly in number until there are very few carnivores at the top. The pyramid of

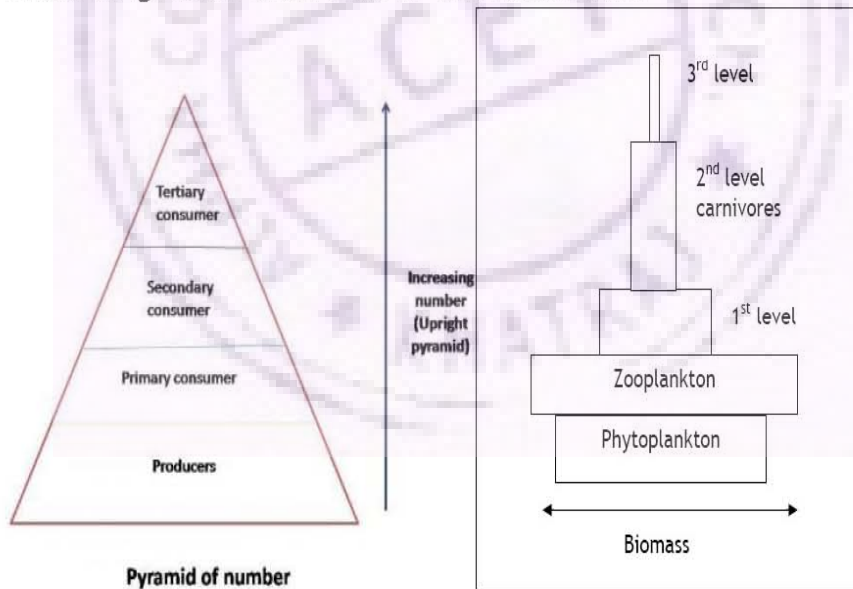
number ignores the biomass of organisms and it also does not indicate the energy transferred or the use of energy by the groups involved. The lake ecosystem provides a typical example for pyramid of number.

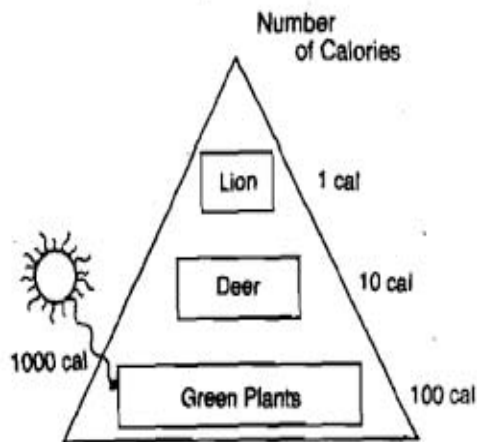
2. **Pyramids of Biomass:**

The biomass of the members of the food chain present at any one time forms the pyramid of the biomass. Pyramid of biomass indicates decrease of biomass in each trophic level from base to apex. For example, the total biomass of the producers ingested by herbivores is more than the total biomass of the herbivores in an ecosystem. Likewise, the total biomass of the primary carnivores (or secondary consumer) will be less than the herbivores and so on.

3. **Pyramids of Energy:**

When production is considered in terms of energy, the pyramid indicates not only the amount of energy flow at each level, but more important, the actual role the various organisms play in the transfer of energy. An energy pyramid illustrates how much energy is needed as it flows upwards to support the next trophic level. Energy pyramids are always slopping because less energy is transferred from each level than was paid into it. In cases such as in open water communities the producers have less bulk than consumers but the energy they store and pass on must be greater than that of the next level.





Pyramid of energy

8. Explain carbon cycle with figure. (June-09, sep-09, july-11)

ANS :

→ Carbon EXISTS in abiotic environment as:

1. Carbon dioxide [CO_2 (gas)] in the atmosphere dissolves in H_2O to form HCO_3^-
2. Carbonate rocks (limestone & coral = CaCO_3)
3. Deposits of coal, petroleum, and natural gas derived from once living things
4. Dead organic matter (humus in the soil)

→ Carbon ENTERS biotic environment through:

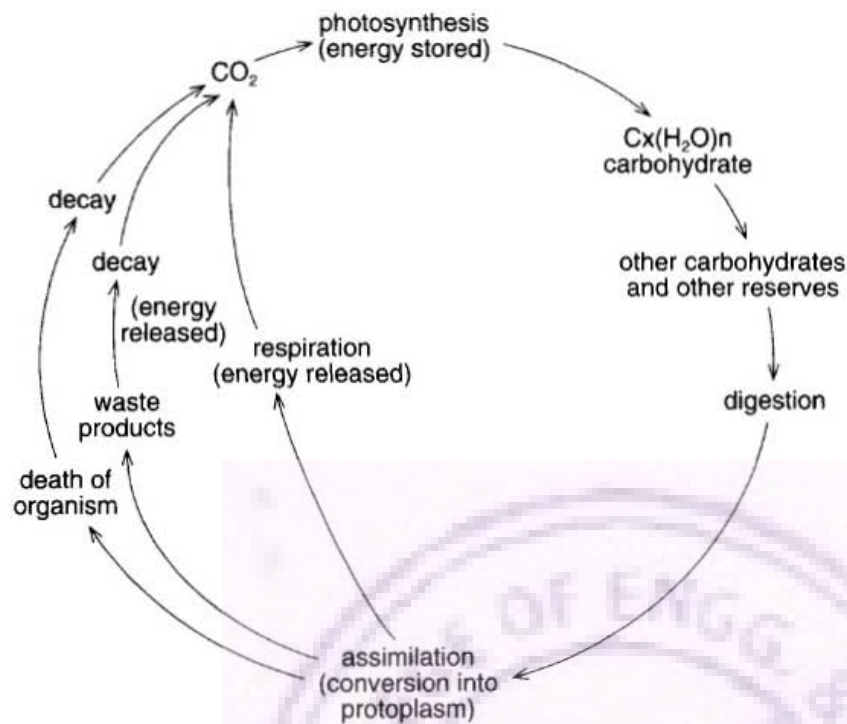
Photosynthesis: changes light energy to chemical energy

→ Carbon RETURNS to atmosphere by:

1. Respiration: CO_2
2. Decomposition / Decay
3. Burning

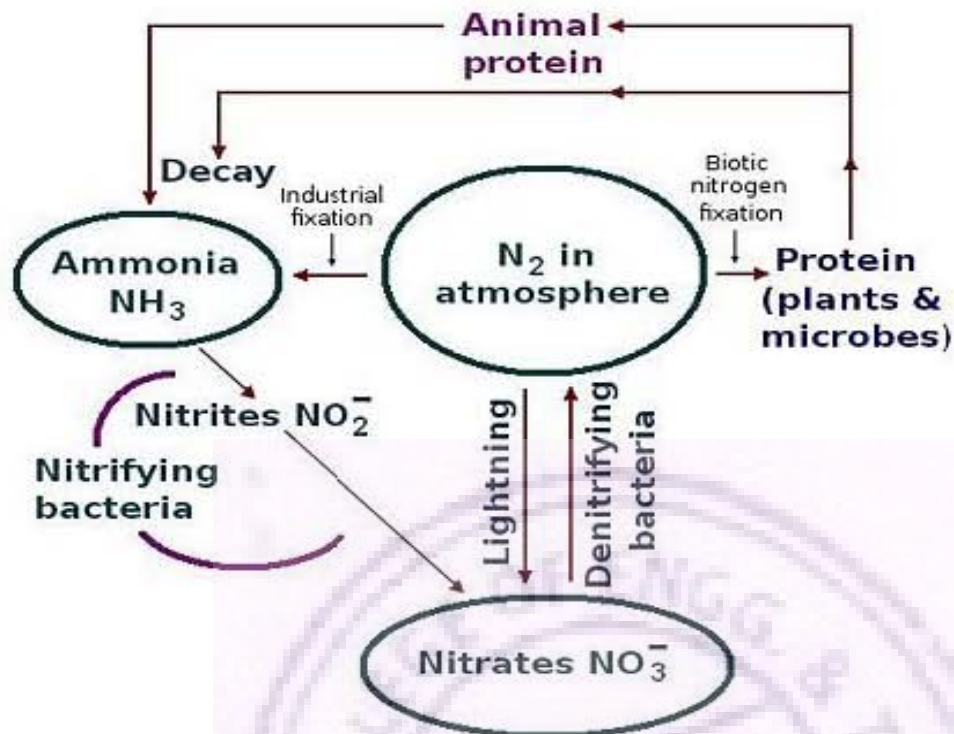
→ Carbon Cycle and Humans:

- 1. Removal of photosynthesizing plants
- 2. Combustion of fossil fuels



9. Explain nitrogen cycle with figure. (Mar-09,sep-09,jan-11,may-12)

- || About 79% of air is N₂ gas
- || Nitrogen is essential to plants and animals and Plants and animals can't use N₂ gas
- || Usable N: ammonia (NH₃) or nitrate (NO₃)
- || Conversion of atmospheric N₂ to NH₃ and NO₃
Nitrogen fixation
 1. Aquatic ecosystems: blue-green algae
 2. Terrestrial ecosystems: bacteria on root nodules of legumes (peas, beans, alfalfa, clover)
 3. Lightening
- || Nitrogen RETURNS to soil by:
 1. decomposition of once living things
e.g. ammonifying bacteria + fungi
 2. exists in soil as nitrate (NO₃⁻), nitrite (NO₂) and ammonia (NH₃)
- || Nitrogen returns to atmosphere by:
 1. denitrifying bacteria
- || Nitrogen Cycle and Humans:
 1. Nitrogen required for genetic materials (DNA, RNA, amino acids)



10. Short note on renewable and non-renewable sources (Mar-09, jan-11, dec-11, june-13)

Renewable resources:

- Renewable resources are resources that are replenished by the environment over relatively short periods of time. This type of resource is much more desirable to use because often a resource renews so fast that it will have regenerated by the time you've used it up.
- Any plants that are grown for use in food and manufactured products are also renewable resources.
- Geothermal energy is a renewable resource that provides heat from the earth - 'geo' means 'earth' and 'thermal' means 'heat'.
- Biofuels are also renewable resources.

Non renewable resources:

- In contrast to renewable resources, non-renewable resources are resources that are not easily replenished by the environment.
- Nonrenewable resources are used worldwide to create electricity, heat homes, power vehicles and manufacture goods.
- Resources are considered nonrenewable if their quantities are limited or if they cannot be replaced as fast as they are used up. Some

nonrenewable resources have been formed over millions of years and will eventually be depleted altogether.

Examples are Petroleum, coal, natural gas, nuclear energy etc.

Q11. Explain in brief about sources of water (Sep-09,june-10,may-12)

Ans:.

Rain, snow, hail and sleet are precipitated upon the surface of the earth as meteorological water and may be considered as the original source of all the water supplied.

Water, as source of drinking water, occurs as:

- Surface water and
- Ground water.

Three aspects should be considered in appraising water resources e.g., the quantity, the quality, and the reliability of available water.

Surface water:

Surface water accumulates mainly as a result of direct runoff from precipitation (rain or snow).Precipitation that does not enter the ground through infiltration or is not returned to the atmosphere by evaporation, flows over the ground surface and is classified as direct runoff.

Surface water supplies may be further divided:

1. River and streams

Stream is a small flowing water. And a **river** is a collection of many streams.

2. Lake and ponds

A **pond** is a body of standing water, either natural or man-made, that is usually smaller than a **lake**.

3. Sea water

Seawater, or salt water, is water from a sea or ocean.

4. Reservoir supplies.

A **reservoir** is a natural or artificial lake, storage pond, or impoundment from a dam which is used to store water. Reservoirs may be created in river valleys by the construction of a dam or may be built by excavation in the ground or by conventional construction techniques such as brickwork or cast concrete.

Ground water:

Groundwater is the water located beneath the earth's surface in soil pore spaces and in the fractures of rock formations.

- The ground water contained 22.4 % of the total fresh water available on earth. It is almost 50- 60 % more than surface water.
- It is found that ground water quality is good compare to surface water.

The ground water is the water which seeps through the soil layer during rainfall. Moreover, runoff water gets absorbed by the soil and accumulates into lower layers of rocks. The ground water flows underground as sub-surface flow. Generally ground water is stored in aquifers. It is duty of all the human being to protect ground water sources.

Q12. Short note on use of water (Mar-10,july-11,may-12,jan-13)

Ans:

Water is one of the most vital natural resources for all life on Earth. The availability and quality of water always have played an important part in determining not only where people can live, but also their quality of life. Even though there always has been plenty of fresh water on Earth, water has not always been available when and where it is needed, nor is it always of suitable quality for all uses. Water must be considered as a finite resource that has limits and boundaries to its availability and suitability for use.

- **Domestic use** includes water that is used in the home every day, including water for normal household purposes, such as drinking, food preparation, bathing, washing clothes and dishes, flushing toilets, and watering lawns and gardens.
- **Commercial water** use includes fresh water for motels, hotels, restaurants, office buildings, other commercial facilities, and civilian and military institutions. Domestic water use is probably the most important daily use of water for most people.
- **Industrial water use** is a valuable resource to the nation's industries for such purposes as processing, cleaning, transportation, dilution, and cooling in manufacturing facilities. Major water-using industries include steel, chemical, paper, and petroleum refining. Industries often reuse the same water over and over for more than one purpose.

- **Irrigation water use** is water artificially applied to farm, orchard, pasture, and horticultural crops, as well as water used to irrigate pastures, for frost and freeze protection, chemical application, crop cooling, harvesting, and for the leaching of salts from the crop root zone. Nonagricultural activities include self-supplied water to irrigate public and private golf courses, park
- **Livestock water use** includes water for stock animals, feed lots, dairies, fish farms, and other nonfarm needs. Water is needed for the production of red meat, poultry, eggs, milk, and wool, and for horses, rabbits, and pets. Livestock water use only includes fresh water.
- **Mining water use** includes water for the extraction of naturally occurring minerals; solids, such as coal and ores; liquids, such as crude petroleum; and gases, such as natural gas. The category includes quarrying, milling (such as crushing, screening, washing, and flotation), and other operations as part of mining activity. A significant portion of the water used for mining, about 32 percent, is saline.
- **Public Supply water use** refers to water withdrawn by public and private water suppliers, such as county and municipal water works, and delivered to users for domestic, commercial, and industrial purposes. In 1995, the majority of the nation's population, about 225 million, or 84 percent, used water delivered from public water suppliers. About 42 million people supplied their own water, with about 99 percent of that water being groundwater, usually from a local well.
- **Thermoelectric Power** water use is the amount of water used in the production of electric power generated with heat. The source of the heat may be from fossil fuels, nuclear fission, or geothermal. Fossil fuel power plants typically reuse water. They generate electricity by turning a turbine using steam power. After the steam is used to turn the turbines, it is condensed back to water by cooling it. The condensed water is then routed back to the boiler, where the cycle begins again.

Q13. Explain types of forests in India (June-09,july-11)

ANS:

The forest of India is ancient in nature and composition. Each Indian forest is rich in variety and shelter a wide range of fauna, flora and insects. The fact that they have existed for very long time is proved from the ancient texts all of which have some mention of the forests. The people revered forests in India and a large number of religious ceremonies centered on trees and plants. Even today in parts of India the sacred groves exist and are worshipped.

Types of Forests in India

In it 16 major forests types are recognized, subdivided into 221 minor types. Structure, physiognomy and floristic are all used as characters to define the types of Indian forest.

The main areas of:

Tropical forest of India are found in the Andaman and Nicobar Islands; the Western Ghats, which fringe the Arabian Sea coastline of peninsular India; and the greater Assam region in the north-east.

Small remnants of rain forest of India are found in Orissa state.

Semi-evergreen rain forest is more extensive than the evergreen formation partly because evergreen forests tend to degrade to semi-evergreen with human interference. There are substantial differences in both the flora and fauna between the three major rain forest regions.

The Western Ghats Monsoon forests in India occur both on the western (coastal) margins of the ghats and on the eastern side where there is less rainfall. Forests in India contain several tree species of great commercial significance (e.g. Indian rosewood *Dalbergia latifolia*, Malabar Kino *Pterocarpus marsupium*, teak and *Terminalia crenulata*), but they have now been cleared from many areas. In the rain forest of India there is an enormous number of tree species. At least 60 percent of the trees of the upper canopy are of species which individually contribute not more than one percent of the total number. Clumps of bamboo occur along streams or in poorly drained hollows throughout the evergreen and semi-evergreen forests of south-west India, probably in areas once cleared for shifting agriculture. Indian Forest

The tropical vegetation of north-east India (which includes the states of Assam, Nagaland, Manipur, Mizoram, Tripura and Meghalaya as well as the plain regions of Arunachal Pradesh) typically occurs at elevations up to 900 m. It embraces evergreen and semi-evergreen rain forests, moist deciduous monsoon forests, riparian forests, swamps and grasslands. Evergreen rain forests in India are found in

the Assam Valley, the foothills of the eastern Himalayas and the lower parts of the Naga Hills, Meghalaya, Mizoram, and Manipur where the rain fall exceeds 2300 mm per annum. In the Assam Valley the giant Dipterocarpus macrocarpus and Shorea assamica occur singly, occasionally attaining a girth of up to 7 m and a height of up to 50 m. The monsoon forests in India are mainly moist sal Shorea robusta forests, which occur widely in this region .

The Andamans and Nicobar islands **have tropical evergreen rain forests** and tropical semi-evergreen rainforests as well as tropical monsoon moist monsoon forests. the dominant species these Indian forest is Dipterocarpus grandiflorus in hilly areas, while Dipterocarpus kerrii is dominant on some islands in the southern parts of the archipelago. The monsoon forests of the Andamans are dominated by Pterocarpus dalbergioides and Terminalia spp

Q14. Explain importance of forests (Dec-08,mar-09,jan-10)

Ans:

Forests have always had **great importance** to people. Prehistoric people got their food mainly by hunting and by gathering wild plants. Many of these people lived in the forest and were a natural part of it. With the development of civilization, people settled in cities. But they still went to the forest to get timber and to hunt.

Today, people depend on forests more than ever, especially for their (1) economic value, (2) environmental value, and (3) enjoyment value. The science of forestry is concerned with increasing and preserving these values by careful management of forestland.

Economic value: Forests supply many products. Wood from forest trees provides lumber, plywood, railroad ties, and shingles. It is also used in making furniture, tool handles, and thousands of other products. In many parts of the world, wood serves as the chief fuel for cooking and heating.

Various manufacturing processes change wood into a great number of different products. Paper is one of the most valuable products made from wood. Other processed wood products include cellophane, plastics, and such fibers as rayon and acetate.

Forests provide many important products besides wood. Latex, which is used in making rubber, and turpentine come from forest trees. Various fats, gums, oils, and

waxes used in manufacturing also come from trees. In some primitive societies, forest plants and animals make up a large part of the people's diet.

Unlike most other natural resources, such as coal, oil, and mineral deposits, forest resources are renewable. As long as there are forests, people can count on a steady supply of forest products.

Environmental value: Forests help conserve and enrich the environment in several ways.

- For example, forest soil soaks up large amounts of rainfall. It thus prevents the rapid runoff of water that can cause erosion and flooding.
- In addition, rain is filtered as it passes through the soil and becomes ground water. This ground water flows through the ground and provides a clean, fresh source of water for streams, lakes, and wells.

Forest plants, like all green plants, help renew the atmosphere. As the trees and other green plants make food, they give off oxygen. They also remove carbon dioxide from the air. People and nearly all other living things require oxygen. If green plants did not continuously renew the oxygen supply, almost all life would soon stop. If carbon dioxide increases in the atmosphere, it could severely alter the earth's climate.

Forests also provide a home for many plants and animals that can live nowhere else. Without the forest, many kinds of wildlife could not exist.

Enjoyment value:

- The natural beauty and peace of the forest offer a special source of enjoyment.
- Many people use these forests for such activities as camping, hiking, and hunting.
- Others visit them simply to enjoy the scenery and relax in the quiet beauty.

Q15. Write in brief about causes of deforestation? (Mar-09,jan-10,jan-11,jan-13)

Ans:

Causes of Deforestation

1. **Agricultural activities:** Agricultural activities are one of the major factors affecting deforestation. Due to overgrowing demand for food products, huge amount of trees are felled down to grow crops and for cattle grazing.

2. **Logging:** Wood based industries like paper, match-sticks, furniture etc also need a substantial amount of wood supply. Wood is used as fuel both directly and indirectly, therefore trees are chopped for supplies. Firewood and charcoal are examples of wood being used as fuel. Some of these industries thrive on illegal wood cutting and felling of trees.

3. **Urbanization:** Further on order to gain access to these forests, the construction of roads are undertaken; here again trees are chopped to create roads. Overpopulation too directly affects forest covers, as with the expansion of cities more land is needed to establish housing and settlements. Therefore forest land is reclaimed.

4. **Desertification of land:** Some of the other factors that lead to deforestation are also part natural and part anthropogenic like Desertification of land. It occurs due to land abuse making it unfit for growth of trees. Many industries in petrochemicals release their waste into rivers which results in soil erosion and make it unfit to grow plants and trees.

5. **Mining:** Oil and coal mining require considerable amount of forest land. Apart from this, roads and highways have to be built to make way for trucks and other equipment. The waste that comes out from mining pollutes the environment and affects the nearby species.

6. **Fires:** Another example would be forest blazes; Hundreds of trees are lost each year due to forest fires in various portions of the world. This happens due to extreme warm summers and milder winters. Fires, whether caused by man or nature results in huge loss of forest cover.

7. **Atmospheric Change/Greenhouse Effect:** Deforestation is having a significant effect on the world's climate and geography. It is one of the primary contributors to modern climate change.

8. **Soil Erosion:** In 'undisturbed' forests there is a very minimal rate of soil loss. Deforestation considerably increases the rate of soil erosion, through the actions of increased rainfall runoff and decreased ground debris. This is further compounded by the increasing aridity of the unprotected soils and the absence of vegetation and roots that work to hold the soil together.

Q16. What is malnutrition or malnourishment? (May-12,jan-13)

Ans:

Malnourishment is the lack of specific components of food such as proteins , vitamins or essential chemical elements.

It is due to nutritional imbalance caused by lack of specific dietary Components or an inability to absorb or utilize essential nutrients.

It may occur in both rich and poor countries. E.g. People in richer countries often eat too much meat and fat and too little fiber , vitamins , trace animals and in poor countries people often lack of specific nutrients because they cannot afford Expensive food.

Problems due to malnutrition

- **Marasmus** : Lack of protein and calories
- **Kwashiorkor** : Lack of protein in diet which leads to stunted growth in infants and cause failure of neural development and learning abilities
- **Anemia** : Caused by inability to absorb iron
- **Goiter** : Lack of iodine
- **Pellagra** : Lack of tryptophan and lysine vitamins

Q17. Explain reasons for over population. (Jan-10,dec-11,may-12)

Ans :

1. **Decline in the Death Rate:** At the root of overpopulation is the difference between the overall birth rate and death rate in populations. If the number of children born each year equals the number of adults that die, then the population will stabilize. Talking about overpopulation shows that while there are many factors that can increase the death rate for short periods of time, the ones that increase the birth rate do so over a long period of time. The discovery of agriculture by our ancestors was one factor that provided them

with the ability to sustain their nutrition without hunting. This created the first imbalance between the two rates.

- 2. Rise in the Birth Rate:** Once again owing to advances in medicine, the average birth rate has gone up. Due to various fertility treatments available today, there are effective solutions to infertility problems, which increases chances of conception. Due to modern medicine, pregnancies are safer. In case of conception after a fertility treatment, there are chances of a multiple pregnancy, further contributing to increasing birth rates. In addition to this, there is a social pressure to have children. This further contributes to overpopulation. Early marriages also contribute to population growth as getting married at an early age increases the chances of having more children. And especially so with the uneducated class where family planning is not adopted.

Lack of Education: Illiteracy is another important factor that contributes to overpopulation. Those lacking education fail to understand the need to curb population growth. Modern methods of birth control and family planning don't reach the illiterate sections of society. Furthermore, due to lack of awareness there is resistance in adopting such methods. The illiterate are unable to understand what impact overpopulation can have. The educated class can make more responsible decisions about marriage and childbirth. Thus education is an effective tool to curb overpopulation.

Cultural Influences: The concept of birth control is not widely accepted. Adopting birth control measures is considered taboo in certain cultures. Some cultures foster beliefs where marrying at a certain age or having a certain number of children is considered to be ideal. In some cultures male children are preferred. This indirectly forces couples to produce children till a child of the preferred gender is conceived. Plus, there is a pressure from the family and society to have children. Social norms influence decisions of starting and extending one's family. In cultures where a woman's role is considered to be that of a child-bearer, large families become the norm.

Migration: Immigration is a problem in some parts of the world. If the inhabitants of various countries migrate to a particular part of the world and settle in that region, the area has to face the negative effects of overpopulation. If the rates of emigration from and immigration to a country

do not match, it results in increased population density in that country. The area becomes thickly populated. People inhabiting the area experience scarcity of resources. This leads to uneven distribution of natural resources which is a direct consequence of overpopulation. Though migration of people between regions does not affect the world population figure, it does lead to something that can qualify as localized overpopulation.

Q-18) Short note on eutrophication (Sep-09, dec-10, jan-11, dec-11, jan-13)

Ans :

Eutrophication: a complex process which occurs both in fresh and marine waters, where excessive development of certain types of algae disturbs the aquatic ecosystems and becomes a threat for animal and human health.

Causes and effects

Causes

- point sources: Waste water from industries, municipalities
Aquaculture
- diffuse sources: Waste water from scattered dwellings
Agriculture, forestry Atmospheric deposition , Natural background load

Effects

- economic: Losses in fisheries , Losses in tourism , Recreation and aesthetic value
- well-fare: Health , Recreation and aesthetic value
-

Control of eutrophication

- planting vegetation along streambeds to slow erosion and absorb nutrients

- controlling application amount and timing of fertilizer
- controlling runoff from feedlots
- Researching use of biological controls; for example, the process of denitrification uses specialized bacteria that convert nitrates to harmless molecular nitrogen.
- Removal of algae bloom by applying algaecides like copper sulphates chlorine etc.
- Using methods to reduce soil pollutions.

Q-19) Explain classification of air pollutants. (Dec-08,jan-11,july-11,jan-13)

Ans :

a)According to origin

1)Primary : Primary pollutants such as oxides of sulphur (SO_x), oxides of nitrogen (NO_x) and hydrocarbons (HC) are those directly emitted into the atmosphere and found there in the same form

2)Secondary : Secondary pollutants are those which are formed in the atmosphere by the interaction of two or more primary pollutants, by processes such as photochemical reaction, hydrolysis and oxidation

Examples of secondary air pollutants:

1. Ozone
2. Peroxy acetyl nitrate (PAN)
3. Photochemical smog
4. Acid mis

B) According to state of matter :

1)Gaseous : Gaseous pollutants are formless fluids that completely occupy the space into which they are released. They behave much like air and do not settle out of the atmosphere. Common gaseous pollutants are CO, CO₂, SO_x, NO_x, HC and oxidants.

2)particulate air pollutant : Includes suspended droplets , solid particles or their mixture in the atmosphere , commonly referred as particulates.

For example , Eerosols , dust , smoke , fumes , mist , fog , flyash , soot and natural particulates such as pollen grains , protozoa , fungal spores and volcanic dust.

Q-20) Short note on acid rain (Dec-08, mar-09, jan-10, dec-11)

Ans :

Definition : When P_H of rain water is less than 5.6 , it is called acid rain.

The natural rain water has P_H of 5.6 at 20° Celsius due to formation of carbonic acid due to dissolution of CO_2 in water

Oxygen, Nitrogen and Sulphur originating from industrial operations and fossil fuel combustion are the major causes of acid rain.

Causes :

Fossil fuel based power plants

Smelting of sulfide ores

Automobile exhaust

Industrial plant using sulphuric and nitric acid

Effects :

Acid rain has been shown to have adverse impacts on forests, freshwaters and soils, killing insect and aquatic life-forms as well as causing damage to buildings and having impacts on human health.

- **Effects on building material**

Acid rain may cause damage to common building materials
It can also deteriorate surface of paints

- **Effect on Aquatic life**

Fish are badly affected by Lake Acidification
It disturbs the food chain of aquatic eco-system
It results in reproductive failure

- **Effect on fertility of soil**

Due to high solubility of acidic rain water , plant nutrients like nitrogen , phosphorous and potassium gets leached away , which reduces fertility of soil.

- **It damages foliage and weakens trees**
- **It makes trees more susceptible to stresses like cold temperature , drought etc.**
- **It makes atmosphere hazy.**

