

**DHANALAKSHMI SRINIVASAN INSTITUTE OF REASERCH AND  
TECHNOLOGY, SIRUVACHUR-621 113  
ENVIRONMENTAL SCIENCE AND ENGINEERING  
PART – B QUESTION AND KEY ANSWER  
UNIT - I**

**1. Explain in detail the causes, effects and control measures of Deforestation**

**Deforestation:**

It is process of removal of forest resources due to natural or man made activities (i.e.) destruction of forests.

**Causes of deforestation:**

**1. Developmental projects:**

Developmental projects causes deforestation through two ways.

1. Through submergence of forest area.
2. Destruction of forest area.

(e.g) big dams, hydro electric projects, road construction etc.

**2. Mining operations:**

It reduces forest areas. (e.g.) Mica, coal, Manganese and lime stone.

**3. Raw materials for industries:**

Wood is an important raw material for various purposes. (e.g.) making boxes, furniture and paper etc.

**4. Fuel requirement:**

Wood is the important fuel for rural and tribal population.

**5. Shifting cultivation:**

Replacement of natural forest ecosystem for mono specific tree plantation. (eg) teak

**6. Forest fires:**

Forest fire destructs thousands of forest.

**7. Over grazing:**

Over grazing by cattle reduces the cultivation land.

## **CONSEQUENCES OF DEFORESTATION (or) ILL EFFECTS (or) IMPACT OF DEFORESTATION**

1. Economic loss
2. Loss of biodiversity
3. Destroys the habitats of various species
4. Reduction in stream flow
5. Increases the rate of global warming
6. Disruption of weather patterns and global climate
7. Degradation of soil and acceleration of the rate of soil erosion.
8. Induces and accelerates mass movement / land slides.
9. Increases flood frequency, magnitude / severity.
10. Breaks the water cycle
11. Breaks the nutrient cycle
12. Loss of forests put additional pressure on the pristine forests.

## **PREVENTIVE MEASURES (OR) AVOID OF DEFORESTATION (OR) METHODS OF CONSERVATION OF FORESTS**

1. New plants of more or less of the same variety should be planted to replace the trees cut down for timber
2. Use of wood for fuel should be discouraged.
3. Forest pests can be controlled by spraying pesticides by using aero planes
4. Forest fire must be controlled by modern techniques.
5. Over grazing by cattle must be controlled.
6. Steps should be taken by the government to discourage the migration of people into the islands from mainland.
7. Education and awareness programmes must be conducted.
8. Strict implementation of law of Forest conservation Act.

## **2. Writeshort notes on environmental impacts of mining?**

### **Mining:**

The process of extracting mineral resources and fossil fuels like coal from the earth.

### **Types of mining**

1. Surface mining: mining of minerals from shallow deposits
2. Underground mining: mining of minerals from deep deposits

### **Steps involved in mining:**

1. Exploration
2. Development

3. Exploitation
4. Ore processing
5. Extraction and purification of minerals

The extent of damage by under ground mining is less than that of surface mining, which needs enormous amount of land area for it's operation and management.

**Effects of mining:**

1. Pollute soil, water and air.
2. Destruction of natural habitat.
3. Continuous removal of minerals leads to the formation of trench where water is logged which contaminates the ground water.
4. Vibrations cause earth quakes.
5. Produces noise pollution
6. Reduces shape and size of the forest.
7. Some timesland slides may also occur.

**3. Discuss the effects of dams on forests and tribal people ?**

**Effects of dams on forest:**

1. Thousands of hectares of forest have been cleared.
  2. Killing of wild animals and destruction of aquatic life.
  3. Spreading of water borne diseases.
  4. Water logging reduces the salinity of the soil.
- (e.g) Narmadhasagar project it has submerged 3.5 lakhs hectares of forest.

**Effects of dam on tribal people:**

1. Construction of big dam leads to the displacement of tribal people.
2. Displacement and cultural change affects the tribal people both mentally and physically.
3. They do not accommodate the modern food habits and life style.
4. Tribal people are ill treated by the modern society.
5. Many of the displaced people were not recognised and resettled or compensated.
6. Body condition of tribal people will not suit with new areas and hence they will be affected by many diseases.

**4. Discuss the problems of fertilizers and pesticides of modern agriculture ?**

**1. Problems in using fertilisers:**

- a. **Excess of fertilisers causes micronutrient imbalance.**

(e.g) Punjab andHaryana

deficiency of nutrient zinc in the soil affect the productivity of the soil.

b. Blue **baby syndrome** (nitrate pollution)

Nitrate present in the fertiliser causes blue baby syndrome, when the amount exceeds the limit leads to death.

**c. Eutrophication:**

Nitrogen and phosphorus in the crop fields washed out by run off water in the water bodies, which increases the nourishment of the lakes called eutrophication. Hence algal species increases rapidly. Life time of the species is less and they decompose easily and pollute the water which affects the aquatic life.

**2. Problems in using pesticides:**

First generation pesticide:

Sulphur, arsenic, lead and mercury. Second generation pesticide: DDT

**Number of side effects:**

Death of non target organism. Producing new pest – super pest

**3. Problems in using pesticides:**

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First generation pesticide:

Sulphur, arsenic, lead and mercury. Second generation pesticide: DDT

**Number of side effects:**

1. Death of non target organism.
2. Producing new pest – super pest
3. Bio magnification – Most of the pesticides are non bio degradable, keep on concentrating in the food chain and it is harmful to human beings.

4. Risk of cancer:

It directly acts as carcinogen

It indirectly supports immune system.

**5. Write short notes on renewable energy resources?**

**Renewable energy sources:**

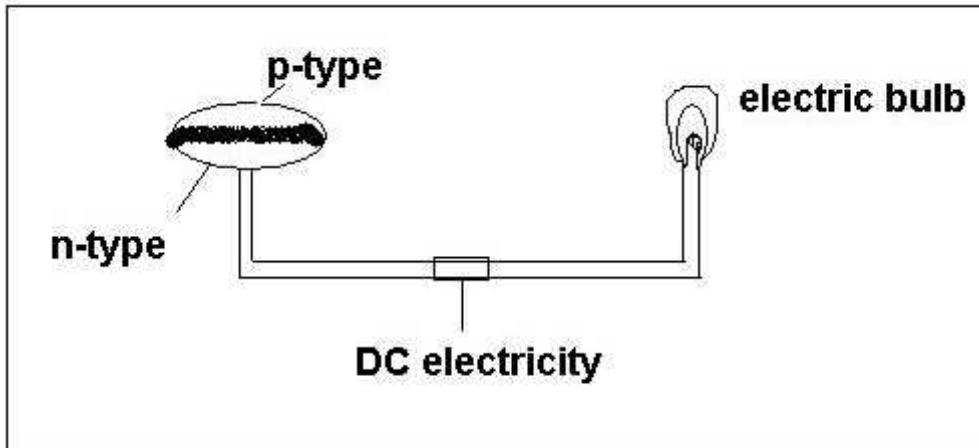
Energy which can be regenerate

**Solar energy:**

Nuclear fusion reaction of sun produces enormous amount of energy. Several techniques are available for collecting, storing and using solar energy.

### Solar cell (or) Photovoltaic cell (or) PV cell:

Solar cell consist of p- type semi conductor (Si doped with B)And n-type semi conductor(Si doped with P). p-type forms top layer and n-type forms bottom layer.. solar rays fall on the top layer , the electrons from valence band promoted to the conduction band which crosses the p-n junction into n-type semi conductor. Potential difference between the two layers is created which causes flow of electrons.



**Solar cell**

### Uses:

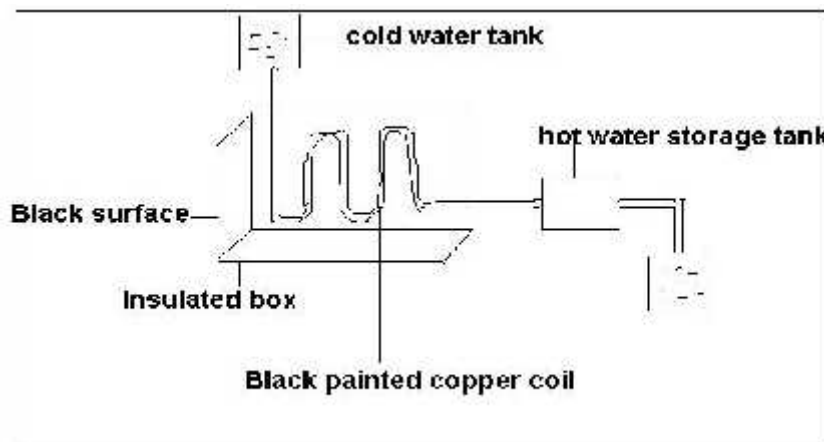
It is used in calculators, electronic watches, street light, water pumps etc.

### Solar battery:

Large number of solar cells connected in series is called solar battery. It is used in remote areas where continuous power supply is a problem.

### Solar water heater:

It consist of insulated box painted with black paint with glass lid. Inside the box black painted copper coil is present. Cold water is allowed to flow, it is heated up and flows out into a storage tank from which water is supplied through pipes.

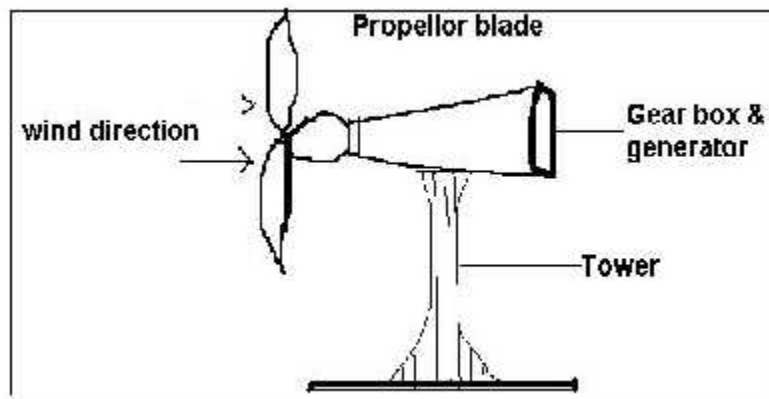


**Windenergy:**

Moving air is called wind. The energy recovered from the force of the wind is called **windenergy**  
**It's speed is high.**

**Wind mills:**

When a blowing wind strikes the blade of the wind mill, it rotates continuously. And rotational motion of the blade drives number of machines like water pump, flour mills and electric generators.

**Wind farms:**

When a large number of mills are installed and joined together in a definite pattern – it forms wind farm. It produces large amount of electricity.

**Condition:**

Minimum speed for wind generator is 15 Km/hr

**Advantages:**

1. It does not cause air pollution
2. Very cheap

**Land resources:**

Land is the most important valuable resource for mankind,  
It provides food, fibre, medicine.  
It is a mixture of inorganic materials and organic materials.  
To construct building  
Acts as a dustbin for most of the wastes created by the modern society.

**Land degradation:**

It is a process of deterioration of soil or loss of fertility.

**Effects of land degradation:**

1. Soil texture and soil structure are destructed.
2. Loss of soil fertility.
3. Loss of valuable nutrients.

4. increase in water logging, salinity, alkalinity and acidity problem.

### **Causes of land degradation:**

#### **1. Population:**

More land is needed for producing food, fibre and fuel wood. So land is degraded due to over exploitation.

#### **2. Urbanisation:**

Urbanisation reduces the agricultural land. Urbanisation leads to deforestation, which in turn affects millions of plants and animals.

#### **3. Fertilizers and pesticides:**

It affects fertility of the soil and causes land pollution.

#### **4. Damage of top soil:**

Increase in food production generally leads to damage of top soil through nutrient depletion.

5. Water logging, soil erosion, salination and contamination of the soil with industrial wastes and cause land degradation.
6. wastes and cause land degradation.

### **6. Write short notes on causes effects and control measures of soil erosion?**

#### **Soil erosion:**

The process of removal of superficial layer of the soil from one place to another is called soil erosion.

#### **Harmful effects of soil erosion:**

1. Soil fertility decreases due to the loss of top soil layer.
2. Loss of its ability to hold water and sediments.
3. Sediments run off can pollute water and kill aquatic life.

#### **Causes of soil**

##### **1. water**

water causes soil erosion in the form of rain, run off, rapid flow and wave action.

##### **2. wind:**

It is an important climatic agent, which carry away the fine particles of soil creates soil erosion.

##### **3. Biotic agent:**

Over grazing, mining and deforestation are the major biotic agent cause soil erosion.

35% of soil erosion is due to over grazing and 30% is due to deforestation.

##### **4. Land slide:**

It causes soil erosion.

## **5. Construction:**

Construction of dams, buildings, roads removes protective vegetal cover and leads to soil erosion.

## **Control of soil erosion (or) Soil conservation practices:**

The art of soil conservation is based on following basic principles

1. To slow down the water for concentrating and moving down the slope in a narrow path.
2. To slow down the water movement when it flows along the slope.
3. To encourage more water to enter into the soil.
4. To increase the size of soil particles.
5. Reduction in the wind velocity near the ground by growing vegetation.

## **7. Discuss the role of an individual in conservation of natural resources?**

### **Conservation of energy:**

1. Switch off light, fan and other appliances when not in use.
2. Use solar heater for cooking.
3. Dry the cloth in the sun light instead of driers.
4. Use always pressure cookers
5. Grow trees near the house to get cool breeze instead of using AC and ai cooler.
6. Ride bicycle or just walk instead of using scooter for a short distance.

### **Conservation of water:**

1. Use minimum water for all domestic purposes.
2. Check the water leaks in pipes and repair them properly.
3. Reuse the soapy water, after washing clothes for washing courtyard, carpets etc.
4. Use drip irrigation.
5. Rain water harvesting system should be installed in all the houses.
6. Sewage treatment plant may be installed in all industries and institutions.
7. Continuous running of water taps should be avoided.
8. Watering of plants should be done in the evening..

### **Conservation of soil:**

1. Grow different type plants i.e trees, herbs and shrubs.
2. In the irrigation process, using strong flow of water should be avoided.
3. Soil erosion can be prevented by sprinkling irrigation.
4. Use green manures in the garden.
5. Use mixed cropping.

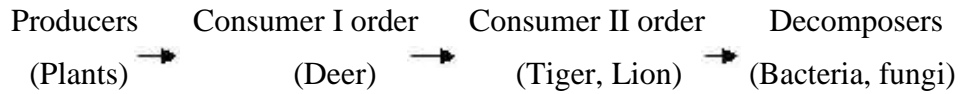


## UNIT II

### 1. Write short notes on i) food chain and food web?

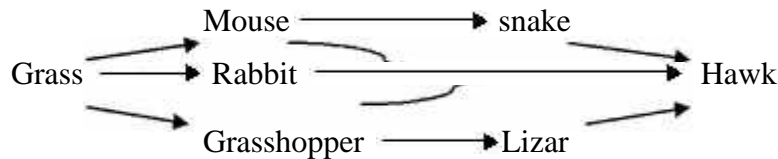
#### FOOD CHAIN :

Plants by photosynthesis convert solar energy into protoplasm. Small herbivores consume the vegetable matter and convert into animal matter which in turn eaten by large carnivores. This sequence of eaten and being eaten , produces transfer of food energy known as food chain.



#### FOOD WEB:

The food relationship between various organisms is being depicted by linking all the possible prey and predators of different food level. In an ecosystem linking of feeding habit relations will provide a food web.



## 2. Explain the characteristic features and functions of forest eco system ?

Definition: It is a natural ecosystem consisting of dense growth of trees and wild animals

Characteristics:

Abiotic: soil, sun light, temperature etc

Biotic : forest trees, shrubs and animals

Structure:

Producer : trees and shrubs

Consumer : Primary – elephants, deer etc.

Secondary – snakes, birds, lizards etc

Tertiary – lions, tigers etc

Decomposers : fungi, bacteria

## 3. Explain the characteristic features and functions of aquatic eco system?

**Definition:**

Deals with water bodies and biotic communities present in them-Classified as fresh water and marine ecosystems. Fresh water systems are classified as lentic and lotic ecosystems.

**Characteristics:**

Structural Components:

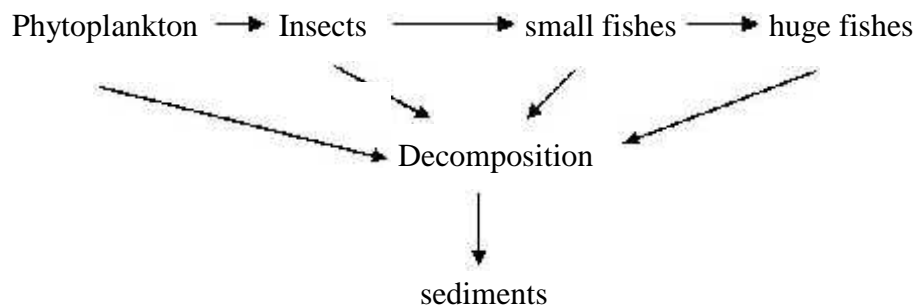
Abiotic: pH, nutrients, D.O, temp, climatic conditions, etc.

Biotic: Phytoplankton, fishes, snails insects, birds, etc.

Functional components:

Ecological pyramid.

Energy flow:



#### 4. Explain the characteristic features and functions of Grassland eco system?

##### GRASSLAND ECOSYSTEM:

Dominated by grass – few shrubs and trees are also found – rainfall average but erratic – overgrazing leads to desertification.

Components:

Structural Components:

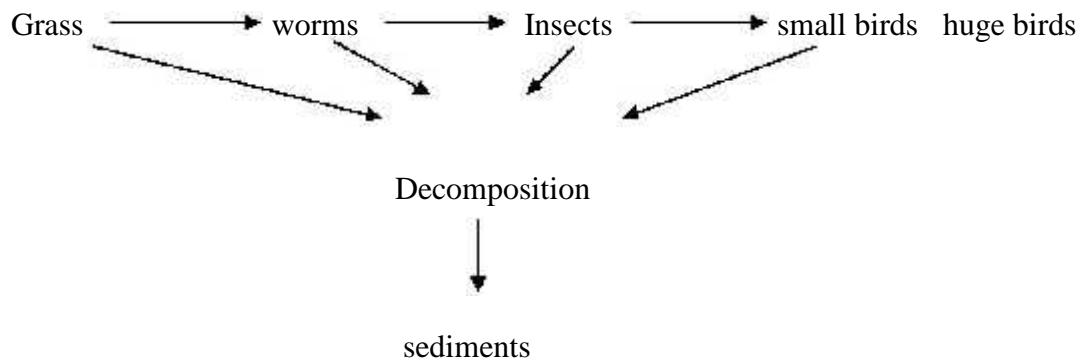
Abiotic: soil pH, nutrients, soil moisture, temp, climatic conditions, etc.

Biotic: grass, caterpillar, butterfly, worms, insects, birds, etc.

Functional components:

Ecological pyramid.

Energy flow:



#### 5. Write short notes on hotspots of biodiversity?

##### Biodiversity Hotspots:

Most of the world's biodiversity are near the equator especially tropical rain forest and coral reefs. Of all the world's species, only 10-15% live in North America and Europe.

The Malaysian Peninsula, for instance, has at least 8000 species of flowering plants, while Britain, with an area twice as large, has only 1400 species. South America has 200 000 species of plants.

Areas isolated by water, desert or mountain can also have high conc. of unique species and biodiversity. New Zealand, South Africa and California are all mid-latitude area isolated by barriers that prevent mixing up of biological communities from other region and produce rich, unusual collection of species.

##### Significance of Biodiversity:

Biosphere is a life supporting system to the human race. Each species in the biosphere has its own significance.

It is the combination of different organisms that enables the biosphere to sustain human race. Biodiversity is vital for a healthy biosphere.

Biodiversity is must for the stability and proper functioning of the biosphere.

Besides these biodiversity is so important due to having consumptive use values, productive use values, social values, ethical values and aesthetic values.

## **6. Explain the In-situ and Ex-situ conservation of biodiversity?**

### **In-situ conservation:**

Conservation of species in its natural habitat, in place where the species normally occurs

The strategy involves establishing small or large protected areas, called protected areas

Today in world, there are 9800 protected areas and 1500 national parks

### **Methods:**

1. Nature or biosphere reserves (Eg) Nilgiri Bio reserve
2. national parks and sanctuaries (Eg) Mudumalai, vedanthangal
3. on farm and home garden conservation for plants, vegetables and fruits to maintain traditional crop varieties.

### **Ex- situ conservation:**

It involves maintenance and breeding of endangered plant and animal species under partially or wholly controlled conditions in zoos, gardens and laboratories

The crucial issue for conservation is to identify those species which are more at risk of extinction.

### **Methods:**

1. long term captive breeding
2. shortage term propagation and release
3. animal translocation and re introductions
4. seed bank
5. reproductive technology
  - (i) embryo transfer technology
  - (ii) cloning

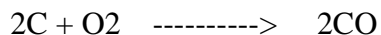
## UNIT-III

### 1. Explain in detail the causes and effects of air pollution?

Air pollution is defined as the presence of one (or) more contaminants like dust, smoke, mist and odour in the atmosphere which causes damage to plants, animals and human beings.

#### Common Air pollutants sources and their effects

**CO** –formed by the incomplete combustion of carbon containing fuels.



**Human Sources** –Cigarette smoking, burning fossil fuels. 77% Co comes from motor vehicle exhaust.

**Health Effect**- Reacts with hemoglobin and reduces the ability of to carry O<sub>2</sub>to body cells and tissues,which causes headaches and anemia.

**NO<sub>2</sub>**–It gives photochemical smog. In atmosphere it reacts with moisture to form HNO<sub>3</sub>.  
NO<sub>2</sub>+Moisture -----> HNO<sub>3</sub>

**Human sources:** Fossil fuel burning in motor vehicles and power industrial plants.Effect Health, Lung irritation and damage

**Environment effect:** HNO<sub>3</sub>corrode metals and eat away stone on buildings, statues, NO<sub>2</sub>damagesfabrics.

**SO<sub>2</sub>**- Formed mostly by the combustion of sulphur containing fossil fuels like coal and oil. It isconverted to H<sub>2</sub>SO<sub>4</sub> in the atmosphere. It is major component of acid deposition.

**Human Source**- Coal burning in power plants and industrial process.

**Health effects**- Breathing problems.

**Environment effect** –Reduce visibility, H<sub>2</sub>SO<sub>4</sub>damages trees, soil and aquatic life.

**Suspended particulate Matter (SPM)** -It includes varieties of particles and droplets.

**Human Sources** –Burning coal in power and industrial plants. Burning diesel and other fuels invehicle, agriculture, unpaved roads construction.

**Health Effect** –Nose and throat irritation, lung damage, asthma, reproductive problems and cancer.

**Environment effect** –Reduce visibility, acid deposition & H<sub>2</sub>SO<sub>4</sub>droplets damage trees.

**O<sub>3</sub>**- Highly reactive irritating gas in the troposphere. It is major component of photo chemical smog.

**Human Source**- Chemical reactions with volatile organic compounds and nitrogen oxides.

**Environment effect** –Moderates the climate.

**Photochemical smog:** Any chemical reaction activated by light is called photochemical reaction. Photochemical smog is a mixture of more than 100 primary and secondary pollutants formed under the influence of sunlight. Its formation begins inside automobile engines and the boilers in coal burning power and industrial plants.

**Health Effect** –Breathing problems, cough, ENT irritation, heart diseases etc.,

**Environment effect** –Smog can reduce visibility.

## **2. Explain in detail the Control measure of air pollution**

1. Emission rates should be restricted to permissible levels in all industries.
2. Air pollution control equipment should be incorporated in plant layout
3. Monitoring of the atmosphere for the pollutants should be carried out continuously to know the emission levels.
4. Scrubber, cyclone separator, bag house filter and electrostatic precipitators must be used in manufacturing process to retain harmful materials that must be disposed of safely.
5. The disposal of the collected air pollutants are equally important for controlling air pollution.
6. Use only unleaded petrol
7. Use fuels that have low sulphurs and ash containing.
8. Plant trees along busy streets because they remove particulates and CO and absorb noise
9. Industries and waste disposal should be outside the city area.
10. Use catalytic converters to control the emission of CO and hydrocarbon.

## **2. Discuss the sources, adverse effects and control methods of water pollution?**

The alternation in physical, chemical & biological characteristics of water which causes harmful effects on humans and aquatic life.

The major pollutants are sewage, effluents, bacteria.

Infections Agents: Bacteria, viruses, protozoa, parasitic worm

**Human Source-** Human and animal works

**Health Effect** –Variety of diseases.

**Oxygen demanding wastes:** Organic wastes, such as animal manure & Plant debris that are decomposed by aerobic bacteria.

**Human Source-** Sewage, animal feedlots, paper mills, food processing facilities.

**Health Effect** –Depletion of dissolved O<sub>2</sub> in water. This causes death of aquatic life.

**Inorganic Chemical** water soluble chemicals like acids. Compounds of toxic metals

like Lead, arsenic and selenium. Salts like NaCl in sea water and fluorides found in some soils

**Human Source**- Industrial effluents, street wash, household waste.

**Health Effect** –Causes skin cancer & neck damage. Damage nervous system, liver & Kidney. Harmful to fish and other aquatic life

**Organic Chemical** Plastics, pesticides, detergents

**Human Source**- Industrial effluents, household waste.

**Health Effect** –Damages nervous system, causes some cancers

**Plant Nutrients**- Water soluble compounds containing Nitrates,  $(NO_3^-)$  and  $NH_4^+$  ions

**Human Source**- Sewage, manure, runoff from agriculture, urban fertilizer.

**Health Effect** –Drinking water with high levels of nitrate lowers the  $O_2$  carrying capacity of blood and kills urban children and infants

**Sediment**–Soil, silt

**Human Source**- Land Erosion

**Health Effect** –Clouds water and reduces photosynthesis. Disturbs aquatic food web  
carry Pesticides, bacteria and other harmful substances.

**Radio active materials**–Radio isotopes of  $I_2$ , radon, uranium and thorium

**Human Source**-  $I^{131}$ ,  $Co^{60}$ ,  $Fe^{55}$  Nuclear power plants, mining and processing of thorium.

**Health Effect** –Genetic mutation, birth defects and certain cancers.

**Thermal Pollution** Excessive heat

**Human Source**- Water cooling of electric power plants and some types of industrial plants. Hence the temperature of water increases. The rise in temperature decreases the dissolved  $O_2$  and affects the aquatic organisms.

#### **4. Explain in detail the Control measure of Water pollution.**

1. All domestic and municipal effluents be drained to waterbodies only after treatment
2. Use of pesticides in agriculture should be limited. Only standard quality pesticides should be used.
3. Chemicals like potassium permanganate should be sprayed regularly to protect water from micro organisms.
4. Radio active substances can be removed by Ion-exchange method.
5. Plants, trees and forests control pollution and they act as natural air conditions.
6. Bacteria are killed by passing chlorine gas into water bodies.
7. Highly qualified and experienced persons should be consulted from time to time for effective control of water pollution.
8. Inorganic wastes can be treated chemically.
9. Acids and bases are removed by neutralization
10. Sewage is treated by biochemical oxidation. The chemicals retard the growth of plants and retard reproduction process.

#### **5. Explain in detail the causes and effects of marine pollution?**

The discharge of waste substances into the sea resulting in harm to the living resources, hazards to the human health, hindrances to the fishery and impairment of quality use of sea water.

##### **Effects of marine pollution:**

1. Heavy metals and organic pollutants damage birds by thinning of egg shells and tissue damage of egg.
2. Oil pollution causes damage to marine animals and plants including algae, birds, fish etc.
3. Oil spilling in the sea causes abnormal low body temperature in birds resulting in hypothermia. During the Exxon Valdez accident 150 rare species of bald eagles are affected by ingested oil.
4. Oil films are able to retard the rate of oxygen uptake by water.
5. Hydrocarbon and benzpyrene accumulate in food chain and consumption of fish by man may cause cancer.

##### **Control of marine pollution:**

Nature and world conservation union suggest the principles

1. The industrial unit on the coastal lines should be equipped with pollution control instrument.
2. Urban growth near the coast should be regulated.

Methods of removal of oil

Physical methods.



- a) skimming the oil off the surface with suction device
- b) Floating oil can be absorbed using absorbing materials like poly urethane foam.
- c) Chopped straw and saw dust also used to absorb oil from the sea water.
- d) Chemical methods like dispersion, emulsification and using chemical additives are used to coagulate the oil

**Protective method:**

1. Municipal and industrial waste should be treated before disposing in to sea
2. Coastal waste are periodically analyzed for detecting pollution level
3. Soil erosion in the coastal land should be arrested by suitable techniques
4. Recreation beaches should be maintained to meet hygienic and aesthetic standard.

**6. Explain in detail the causes and effects of Radio active pollution?**

Radioactive pollution is the physical pollution of air water and soil by radioactive materials. Sources:

Natural source:

The important natural source is space which emits cosmic rays. Soil rocks, air radioactive  $Rd^{222}$  also contain one or more radioactive substances. Man made resources:

Nuclear power plants X-rays, nuclear accidents, nuclear bombs. Mining and refining of plutonium, thorium and preparation of radioactive isotopes.

**Effects:**

1. Damages to enzymes, DNA, RNA through ionization, cross linkings within and between two affected molecules.
2. Damage to cell membranes, chromosomes such as fragmentation mitochondria etc.
3. Disruption of central nervous system, loss of sight, inactivation of bone marrow activity resulting in blood cancer, malignance and ulcerisation in intestinal tract.
4. Death or shortening of life span due to radiation changes in characteristics due to mutation.
5. Internal bleeding and blood vessel damage may show up as red spots on the skin.
6. Urban children are vulnerable to brain damage or mental retardation if radiation occurs in early pregnancy.

**Control Measures:**

- 1 Nuclear devices should never be exploded in air. If necessary they may be exploded under ground.
2. Leakage of radioactive elements from reactors and labs processing or using them should be totally checked.

3. In nuclear and chemical industries the use of radio isotopes may be carried under a jet of soil or water instead of powder or gaseous form.
4. In nuclear mines wet drilling may be employed along with underground drainage.
5. Nuclear medicines and radiation therapy should be applied when absolutely necessary with minimum dose.
6. Minimum number of nuclear installations should be commissioned.

### **7. Explain in detail the process of solid waste management?**

Management of solid waste is very important to minimize adverse effect of solid waste.

#### **Types of solid waste**

Urban waste

Industrial waste.

Sources of urban waste: domestic waste like food waste, waste paper, glass bottles, polythene bags etc. Commercial waste like packing materials cans, bottles, polythene bags etc

Construction wastes like concrete, wood, debris etc .Biomedical waste like Anatomical waste, infectious waste etc

#### **Classification of urban waste:**

1. Biodegradable wastes – urban solid waste materials that can be degraded by micro organisms are called biodegradable waste. E.g. food, vegetables, Tea leaves, dried leaves etc.
2. Non biodegradable waste. Urban solid wastes that cannot be degraded by microorganisms are called non biodegradable wastes.

#### **SOURCES OF INDUSTRIAL WASTES**

The main source of industrial waste is chemical industries, metal and mineral processing industries. E.g.

1. Nuclear power plants generate radioactive wastes
2. thermal power plants produce fly ash in large quantities
3. Chemical industries produce toxic and hazardous materials.
4. other industries produce packing materials acid, alkalis, scrap metals, rubber, plastic, glass wood etc

#### **EFFECT OF SOLID WASTE**

1. Biodegradable materials in the disposed municipal waste undergo decomposition. This produces foul smell and breeds various types of insects which spoil land well.
2. Industrial waste containing toxic metals and hazardous waste affect soil characteristics.
3. Toxic substances name percolate into the ground and contaminates the ground water.

4. Burning of some industrial waste or domestic waste produces furan, dioxins and polychlorinated biphenyls which are harmful to human beings.

## UNIT-IV

### **1. What is sustainable development? Discuss in brief the concept of sustainable development.**

Meeting the needs of the present without compromising the ability of future generations to meet their own needs.

- Concept for sustainable development;
  1. Developing appropriate technology
  2. Reduce, reuse, recycle (3-R) approach
  3. Providing environmental education and awareness
  4. Consumption of renewable resources.
  5. Conservation of non-renewable resources
  6. Population control.

### **2. What are waste lands? Name and discuss the various methods of waste land reclamation.**

The land which is not in use (or unproductive) is called waste land.

Various methods;

1. Drainage
  2. Leaching
  3. Irrigation practices
  4. Green manures and biofertilizers.
  5. Applications of gypsum.
  6. Afforestation programmes.
6. Social forestry programmes.

### **3. Write notes on**

#### **(i) ozone layer depletion**

Hole in ozone is termed as ozone layer depletion.

Ozone depleting substances;

1. Chloro fluoro carbon (CFC)
2. Hydro chloro fluoro carbon (HCFC).
3. Bromo fluoro carbons (BFC)
4. Other chemicals like halogen compound and sulphur dioxide.

Consequences of ozone layer depletion;

1. Effect on human health.
2. Effect on aquatic system
3. Effect on materials.
4. Effect on climate.

## **(ii) Acid rain**

The presence of SO<sub>2</sub> & NO<sub>2</sub> gases as pollutants in the atmosphere, the pH of the rain water is further lowered. This type of precipitation of water is called acid rain (or) acid deposition.

Effect (impact) of acid rain;

1. Effect of acid rain on human beings .
2. Effect of acid rain on buildings.
3. Effect of acid rain on terrestrial and lake ecosystems.
4. Control measures of Acid rain.

**4. Write notes on Watershed management. The management of rainfall and resultant runoff is called watershed management. It also involves conservation, regeneration and proper use of water.**

### **Watershed management techniques**

1. Trenches (Pits)
2. Earthen dam (or) stone embankment
3. Farm pond
4. Underground barriers (Dykes)

Maintenance of watershed (or) components of integrated watershed management

1. Water harvesting
2. Afforestation and Agroforestry
3. . Reducing soil erosion
4. . Scientific mining and quarrying
5. . Public participation
6. . Minimising livestock population
- 7.

**5. What is rain water harvesting? Name and discuss in brief the types of rain water harvesting.**

Rainwater harvesting is a technique of capturing and storing of rainwater for further utilization.

Need (or) Objectives of Rainwater Harvesting

Method (or) type of Rain water Harvesting

Roof Top Rainwater Harvesting Method

Advantages of Rainwater Harvesting

## UNIT-V

### **1. Explain the term population explosion. Enumerate its effects.**

The enormous increase in population, due to low death rate (mortality) and high birth rate (Natality), is termed as population explosion. The human population is not increasing at a uniform rate in all parts of the world.

#### Doubling Time

The number of years needed for a population to double in size.

#### Causes (or) reasons of population explosion

Effect of population Explosion (or) Environmental and social impacts of growing population

1. poverty
2. Increasing demands for food and natural resources.
3. Inadequate housing and health services.
4. Loss of agricultural lands.
5. Unemployment and socio-political unrest.
6. Environmental pollution.

### **2. What is value education? Discuss the concept of value education.**

Value education is an instrument used to analyse our behavior and provide proper direction to our youths. It teaches them the distinction between right and wrong, to be compassionate, helpful, loving, generous and tolerant. So that a youth can move towards the sustainable future.

#### Methods of imparting value education

1. telling
2. Modeling
3. Role playing
4. Problem solving
5. Studying biographies of great man

#### Types of Values

1. Universal values (or) Social values
2. Cultural values
3. Individual values
4. Global values
5. Spiritual values

### **3. Discuss in detail the role of Information technology in environmental management and human health.**

Information technology plays a vital role in the field of environmental education. Information technology means collection, processing storage and dissemination of information. A number of software has been developed to study about the environment.

#### Softwares for environment education

1. Remote Sensing

#### Application of remote sensing

1. In agriculture
2. In forestry
3. In land cover
4. Water resources
2. Database

Database is the collection of inter-related data on various subjects. In the computer the information of data base is arranged in a systematic manner that is easily manageable and can be very quickly retrieved.

Applications of database

- A. The Ministry of Environment and Forest
- B. Nation Management Information System
- C. Environmental Information System
3. Geographical Information System
4. Satellite data
5. World wide web

More current data is available on world wide web.

#### **4. Discuss the problems, diagnosis and control of AIDS.**

Acquired Immuno Deficiency syndrome caused by a virus called HIV (Human Immune deficiency virus).

Origin HIV / AIDS

1. Through African Monkey
2. Through Vaccine Programmes

Symptoms (Minor and Major)

Control And Preventive Measures AIDS

1. Education
2. Prevention of Blood borne HIV Transmission
3. Primary Health Care
4. Counselling Services
5. Drug Treatment

Effects of HIV/ AIDS

Large number of death occurs, which affect environment and natural resources.

#### **5. Write a note on women and child welfare.**

Need of Women Welfare

Necessity of formation of women self help group

Objectives of A National Commission For Women

Various schemes of various Organisations Towards Women Welfare

1. The National Network for Women and mining
2. United Nations Decade for Women
3. International Convention on the Elimination of All Forms of Discrimination Against Women
4. Non-Government Organizations as Mahila Mandals
5. Ministry for Women And Child Development

## CHILD WELFARE

Children occupy nearly 40% of total population. They are considered to be the assets of a society.

### Reason for Child Labours

1. Poverty
2. Want of Money

### Various schemes of Various Organisations towards Child Welfare\

1. UN Conventions on Rights of Child (or) International law
  - i. Rights of the Child
  - ii. The right to survival
  - iii. The right to participation
  - iv. The right to development
  - v. The right to protection
2. World summit on children
3. Ministry of Human Resource Development.