BALASORE SCHOOL OF ENGINEERING

SUB – ENVIRONMETAL STUDIES

BRANCH – ELECTRICAL & CIVIL ENGINEERING

TH-5

3RD SEM

FACULTY – TANMAYEE BEHERA

Chapter- 01

Long Type

1. Explain environmental science is a multidisciplinary science. (S-16)

Ans:- Environment is the physical, chemical and biological condition of the region in which an organism lives. Therefore environment is the sum of all condition and influences the development and life of all organism on the planet earth. The physical condition that environment study deals with are the atmosphere, the land, the rivers and the oceans.

Environment Science :- It deals with the scientific study of environmental system (air, soil, water and land), the inherent change on organism and the environment damage as a result of human interaction with the environment.

Environmental Engg. :- It deals with the study of technical process involved in the protection of environment from the effect of human activity and improving the environmental quality for the health of humans.

Environment Management :- It promotes due regard for physical, social and economic environment of the enterprise or projects. It encourages planned investment at the start of the production chain rather than forced investment in cleaning of at the end.

2. Discuss the scope and importance of environment. (S-16)

Ans :- The **scope** of environmental studies include:

1. Developing an awareness and sensitivity to the total environment and its related problems
2. Motivating people for active participation in environmental protection and improvement.
3. Developing skills for active identification and development of solutions to environmental problems.
4. Imbibe and inculcate the necessity for conservation of natural resources
5. Evaluation of environmental programmes in terms of social, economic, ecological and aesthetic factors.

Importance of Environment :-

The environment studies make us aware about the importance of protection and conservation of our mother earth and about the destruction due to the release of pollution into the environment. The increase in human and animal population, industries and other issues make the survival cumbersome. A great number of environment issues have grown in size and make the system more complex day by day, threatening the survival of mankind on earth.

3. Define environment importance of environmental study and need for public awareness. [2014] [7 marks]

Ans: The word environment is derived from the French word 'environ' meaning surroundings. Hence, everything surrounding us is called "ENVIRONMENT".

Importance of environmental study:

It is required to enlighten us about the importance of protection and conservation of the environment.

(I) Environmental issues of international
   (a) Global warming.
   (b) Ozone depletion.
   (c) Biodiversity .

(d) Marine pollution.

(II) Problem arised due to development.
   (a) Development leads to urbanisation, industrial growth, transportation, housing, agriculture.

(III) Explosively increase in pollution.

(IV) Need of alternative solution.
   (a) Over goal is to achieve healthy environment with sustainable development.
   (b) Creation of developed society, reducing wastage.

(V) Need to save humanity from extinction.

(VI) Need for wise planning of development.

Need of public awareness:

It is essential to make public aware of consequence of environmental degradation which would result in extinction of life.

(I) Growing population.
(II) Poverty.
(III) Agricultural growth.(excessive agriculture leads to reduction of fertility of soil)
(IV) Development and extinction of forest.(due to deforestation)
(V) Need of ground water.(excessive industries and factories have polluted surface water and ground water which hamper safe drinking)
(VI) Degradation of land by erosion.(due to agriculture)
(VII) Evil consequence of urbanisation.
(VIII) Air and water pollution.

Chapter-02

Short type

1. What are exhaustible and inexhaustible natural resources? Give example. (S-16)

Ans:- Exhaustible

- These resources are available in limited quantities in nature.
- They took large time in order to generate.
- They are irreversible, not replaceable or once vanish cannot be used again and again.
- Examples:- coal, petrol, diesel, natural gas etc....

Inexhaustible

- They are abundant in nature.
- They are generated almost every day.
  - They are reversible,replaceable and hence can be used again and again.
  - Example:- sunlight, wind, water etc.

2. What are sources of energy. [2015(w)] [2 marks]

Ans: The sources of energy are solar, wind, water, geothermal, biomass, fossil fuel etc. (coal, oil , natural gas etc)

Medium type

1. Write the effects of modern agriculture on world food resources. (S-16)

Ans:- Effect of Modern Agriculture :-

- The transformation from traditional to modern mechanised agriculture practice took some year.
- The aim of such was to sustain a bigger population and to meet the over increasing needs of man.
- The use of tractor, diesel pump, harvesters & many other farm machines used for seeding and harvesting of crops because air pollution.
- The use of pesticides, fungicides sprays cause a lot of severe and harmful air pollution, water pollution and also polluted the underground water.
- The modern agriculture encourages production of only those crops which need a lot of irrigation water. Less water requiring crops like bazra etc became outdated.
- Large scale development of agriculture has resulted in the conversion forest area into agricultural field. The less of forest have only reduced the carbon dioxide absorption capability and oxygen producing capability of our environment.

Long type

1. What do you mean by deforestation? Write its causes and consequences. (S-16)

Deforestation :- "Destruction of forest by cutting trees is called Deforestation. "

Cause for Deforestation :-

- Day by day the population of world is increasing.
- So that the trees are being cut to meet the purpose of making house, roads, institutes, industry, agriculture etc.
- For the making of timber are being cut and for making of paper the trees in the forest are being cut.
- For the development of Projects/Dams, forest has to be destroyed..
- Much of the deforestation has been caused for clearing the forest for developing urban or agricultural land.

Consequences of Deforestation:-

1. Disrupted river flow :- Deforestation increases the soil erosion and decreases rainfall. Both these factors in turns affect the flow of rivers and the path taken by them.

2. Flooding :- Deforestation results in increased instances of flooding as there is lack of trees that bind the soil the soil and absorb water. The deposition of soil in riverbed decreases the depth of water.

3. Droughts :- Fewer trees means more carbon dioxide in atmosphere. This leads to global warming i,e increase in temp. On the earth that in turn disturbs the water cycle. Due to decreased rainfall droughts occur.

4. Wildlife extinction :- Since forest provides habitat to many plants and animals. Deforestation makes these animals homeless. This is the main cause of extinction of large no. of rare plants and animals.

5. Displacement of forest dwellers: - The tribes for whom forest is their only home are also displaced due to Deforestation.

2. What are mineral resources ? Explain how mining affects environment? (S-19)

Ans :- Minerals :-

- The earth crust contains several rocks,which are of great utility to humans in their day today use.
- These rocks are made up of inorganic substances called ''minerals ".
- Examples: Metallic minerals – Iron, copper, gold, aluminium, zinc etc

Non-metallic minerals :- Rock salt, gypsum, asbestos, limestone, clay ,talc etc

Environmental problems of mining :-

- Mining operations are considered one of the main sources of environmental degradation.
- The extraction of all these products from the lithosphere has a variety of side effects.
- Depletion of available land due to mining, waste from industries, conversion of land to industry and pollution of land, water and air by industrial wastes, are environmental side effects of the use of these non-renewable resources.
- Mining wastes often contain mush sulphur; their watery contains sulphuric acid which destroys aquatic life in streams.
- Similar problem are also associated with surface mining of nickel, phosphates etc.
- Dredging for gold damages many stream beds and river beds. Such dredging is destructive to aquatic life and water quality.

3. What is the role of an individual in conservation of natural resources. [7marks]

Ans: Already we know that natural resources are exhausting rapidly, we must conserve for future generation. so its duty of individual to conserve natural resources.

MEASURES CONSERVATION OF NATURAL RESOURCES:

i. Conservation of energy:

- switch off lights, fans and other appliances when not in use.
- Use solar heater for cooking your food on sunny days, which will cut down your LPG expenses.
- grow trees near the houses and get a cool breeze and shade .this will cut off your electricity charges on A/C and coolers.
- Use always pressure cooker.

ii.Conservation of water:

- use minimum amount of water for all domestic purposes.
- check for water leaks in pipes and toilets and repair them promptly.
- reuse the soapy water, after washing clothes, for washing off the courtyards, drive ways, etc..,
- built rainwater harvesting system in your house.

iii.conservation of soil:

- grow different types of plants, trees and grass in your garden and open areas, which bind the soil and prevent erosion.
- don’t use more fertilizer and pesticides.
- use nature manure to the crops..

iv.conservation of food resources:

- don’t waste the food instead give it to someone before getting spoiled.
- cook only required amount of the food.
- store the food resources for the future use.

v.conservation of forest:

- use non-timber products.
- plant more trees and protect them.
- over grassing must be controlled.
- minimise the use of papers and fuel wood.
- avoid of executing developmental works like dam, road and industrial constructions in forest areas.

Chapter-03

Short type

1. Define ecology. (S-16)

Ans :-

- The term Ecology has been derived from teo Greek words : (Oikos=house and logos=study).
- Ecology is the study of the household of the planet.
- The household consists of non-living(abiotic) matters such as soil and water and living(biotic) organism such as micro-organism, plants and animals including man.

2. What is aquatic ecosystem. [2015(w)] [2marks]

Ans: An aquatic ecosystem is an ecosystem in a body of water. Communities of organisms that are dependent on each other and on their environment live in aquatic ecosystems. The two main types of aquatic ecosystems are marine ecosystems and freshwater ecosystems.

3. What are autotrophs and heterotrophs? (S-16)

Ans :- Autotrophs :- The organisms which are capable of producing their own food are called autotrophs.

Examples:- All the green plants such as trees, crops, grass etc.

Heterotrophs :- (hetero=other;tropic=nourishing). They are not capable of producing their own food. They depends directly or indirectly on producers for their food.

Examples :- All animals

Medium type

1. Explain the energy flow in the ecosystem and show that it is unidirectional. (S-16)

Energy is the capacity to do work. Forall biological activity ,organisms require energ.The energy ultimately comes from the Sun.Solar energy is transformed to chemical energy by the process of photosynthesis in the green plants.The consumers who are heterotrophs directly or indirectly depends on the green plants for their food.Therefore the energy flows from sun to plant and then to other heterotrophic organisms such as herbivorous, carnivore order-1 and carnivore order-2.The flow of energy from autotrophs to heterotrophs is unidirectional.Therefore energy flow in ecosystems can be defined as “unidirectional flow of energy from the sun to plants and then to all heterotrophic organism in a non-cyclic manner.”

Diagram:-

2. Explain biotic and abiotic ecosystem. [2015(w)] [5marks]

Ans: Abiotic ecosystem:

- Abiotic ecosystem refers to non-living physical and chemical elements in the ecosystem. Abiotic resources are usually obtained from the lithosphere, atmosphere, and hydrosphere.
- Examples of abiotic factors are water, air, soil, sunlight, and minerals.

Biotic ecosystem:

- Biotic ecosystem refers to living or once-living organisms in the ecosystem. These are obtained from the biosphere and are capable of reproduction.
- Examples of biotic factors are animals, birds, plants, fungi, and other similar organisms.

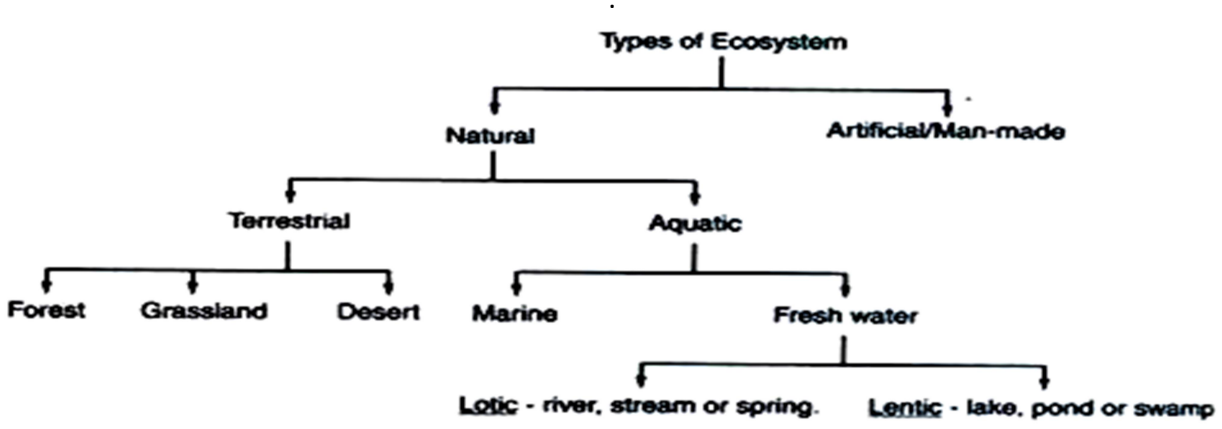
Long type

1. What is ecosyatem.Classify it and what are the function of ecosystem. [2015(w)] [7 marks]

Ans: Ecosystem:

An ecosystem is a natural system consisting of all plants, animals and microorganisms (biotic factors) in an area functioning together with all the non-living physical (abiotic) factors of the environment.

` Types of ecosystem:



(a) Natural Ecosystems:

These ecosystems are capable of operating and maintaining themselves without any major interference by man.

A classification based on their habitat can further be made:

1. Terrestrial ecosystems: forest, grassland and desert.

2. Aquatic ecosystems: fresh water ecosystem, viz. pond, lake, river and marine ecosystems, viz. ocean, sea or estuary.

(b) Artificial Ecosystem:

These are maintained by man. These are manipulated by man for different purposes, e.g., croplands, artificial lakes and reservoirs, townships and cities.

Function and structure of ecosystem:

Each ecosystem has two main components:

(1) Abiotic

(2) Biotic

(1) Abiotic Components:

The non living factors or the physical environment prevailing in an ecosystem form the abiotic components. They have a strong influence on the structure, distribution, behaviour and inter-relationship of organisms. Abiotic components are mainly of two types:

(a) Climatic Factors:

Which include rain, temperature, light, wind, humidity etc.

(b) Edaphic Factors:

Which include soil, pH, topography minerals etc.?

(2) Biotic Components:

The living organisms including plants, animals and micro-organisms (Bacteria and Fungi) that are present in an ecosystem form the biotic components.

On the basis of their role in the ecosystem the biotic components can be classified into three main groups:

(A) Producers

(B) Consumers

(C) Decomposers or Reducers.

2. What is the function of food chain and food web in an ecosystem. [2012,2013,2015(W)] [7marks]

Ans: Food Chain :

- For an ecosystem to work there has to be a flow of energy within it. The organisms of the ecosystem need energy in the form of food.

- The ultimate source of this energy is the sun. Producers like green plants trap solar energy and convert it into the chemical energy of food. When a primary consumer eats the producer, a part of this energy is passed on to it.
- The primary consumer is then eaten by a secondary consumer. And the secondary consumer may be eaten by a tertiary consumer, and so on. In this way energy gets transferred from one consumer to the next higher level of consumer. A series of organisms through which food energy flows in an ecosystem is called a food chain.

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- A food chain in an ecosystem is a series of organisms in which each organism feeds on the one below it in the series.

- In a forest ecosystem, grass is eaten by a deer, which in turn is eaten by a tiger. The grass, deer and tiger form a food chain . In this food chain, energy flows from the grass (producer) to the deer (primary consumer) to the tiger (secondary consumer).

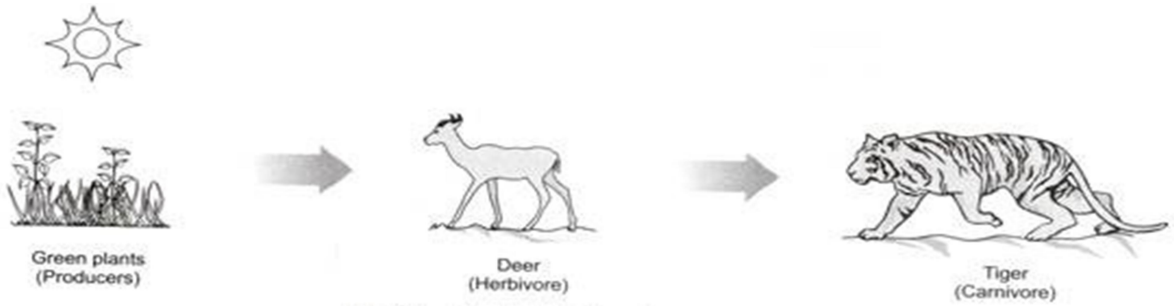


Fig. 8.2 A food chain in a forest ecosystem

Some common food chains are mentioned below:

Plants → Deer → Lion

Plants → Worm→ Bird → Cat

Plants→ Grasshopper→ Frog→ Snake→ Hawk

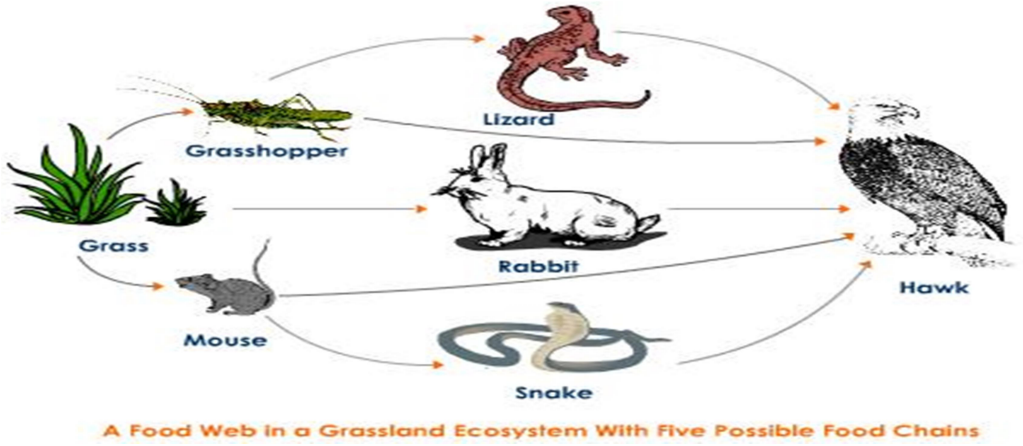
Algae→ Small→ animal → Small fish → Big fish —> Bird

Food web:

- The sun is the ultimate source of energy for life on Earth. Without it, nothing would be able to survive. As a result, living things have evolved special ways to harness the energy of the sun and use it for their own well-being. They have also developed special relationships and interactions that allow energy to be transferred. Once the energy has been captured, it gets passed around through the various organisms in a particular area. This transfer of energy is called a food web.
- In their simplest form, food webs are made of food chains. Food chains show a direct transfer of energy between organisms.

- The inter-locking pattern of food chains in an ecosystem is also called as food web.

Example:



A Food Web in a Grassland Ecosystem With Five Possible Food Chains

3. Explain different component of ecosystem. [2015(w)] [7marks]

Ans: Components of ecosystem includes the following:

1. Inorganic substances: These are simpler materials which are build up to form complex compounds that makes up the body of living organisms e.g C, N, CO2, H2O etc.
2. Organic substances: These are compounds of carbon that forms a link between living and non-living parts of an ecosystem.They are formed from inorganic compounds and passed into the body of living organisms through feeding.
3. Climatic factors: These includes physical factors such as temperature, light, relative humidity, rainfall etc., they determined abundance of organisms in their habitats and also determined which organism to survive, in which habitat and in what condition.
4. Producers: These are autotrophic organisms that manufacture foods from simple inorganic substances using CO2 and H2O in the presence of sunlight. all other organisms depend either directly or indirectly on producers.
5. Consumers: These are heterotrophic organisms mainly animals that ingest organic matter from other organisms.
6. Decomposers: They are also known as recyclers and mainly bacteria and fungi. they break down dead protoplasm of an organisms to release their products back to inorganic materials usable by producers.

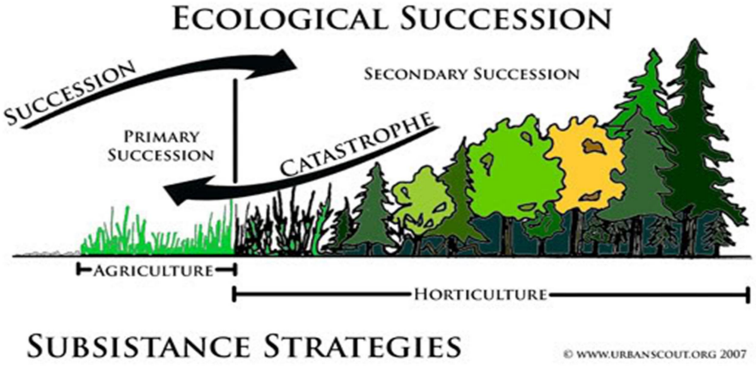
4. What is Ecological succession. [2015(w)] [5 marks]

Ans: Ecological succession is the observed process of change in the species structure of an ecological community over time. The time scale can be decades (for example, after a wildfire), or even millions of years after a mass extinction.

Different Types of Ecological Succession:

Ecological succession happens for a few different reasons:

Primary succession is initiated when a new area that has never previously supported an ecological community is colonized by plants and animals. This could be on newly exposed rock surfaces from landslides or lava flows.



Secondary succession occurs when an area that has previously had an ecological community is so disturbed or changed that the original community was destroyed, and a new community moves in. This is

more common than primary succession and is often the result of natural disasters such as fires, floods, and winds, as well as human interference such as logging and clear-cutting.

Seasonal succession is another type of succession, but instead of being the result of a disastrous event,it is caused by cyclical changes in the environment or interactions between the species in a community.

Chapter-06

Short type

1. **What are Greenhouse gases.(S-16)**

Ans:- The green house gases are Carbon dioxide, Methane, Nitrous oxide and Chlorofluorocarbon.

Medium type

1. **Write short notes on watershed management. (S-16)**

Ans.

- A watershed is a natural topographic unit, a part of the earth surface moulded by weathering, particularly by the action of running water.
- A watershed includes all the land and water area which contributes run off to a certain point.
- Watershed is marked by an elevated line that forms a division between two area drained by separate streams.
- Since watershed are natural units, they are ideal for planning and management of natural resources.
- Most of the watershed need ecological restoration which is a process of protecting and nursing back to health the life support system.
- It protects watershed area damaged by misuse of over-use and the development process is to be carried out by the people of that watershed.

Long type

1. **What are the major points of Air Prevention and Control of Pollution Act,1981. [2016, 3(c)]**
    - The Air (Prevention and control of Pollution) Act was passed in 1981 to regulate and control the hazardous emission from the automobiles and industrial units.
    - The Central Board of prevention and Control of Water Pollution is authorized to implement and enforce the act.
    - The Central Board is also empowered to co-ordinate the activity of the state Boards present in every state of India.
    - The state Govt. can declare any area within the state as " air pollution control area" and prohibit setting of industry causing air pollution.
    - The Central Pollution Board has laid down standards for the quality of emission air.
    - Any "equipments" or any combustible material which generate fume & gas must be approved by state board.
    - The "fuel" which are used must be approved by board.
    - "Automobiles" or any other method of generating power must be approved by board.
    - "Chimney" opening structure done properly through which any air pollutant may be emitted.

2. Write short notes on : [2015(w)]

(i) Acid rain (ii) Greenhouse effect (iii) Ozone layer depletion.

Ans: Acid rain

- Acid rain is a rain or any other form of precipitation that is unusually acidic, meaning that it possesses elevated levels of hydrogen ions (low pH).
- It can have harmful effects on plants, aquatic animals and infrastructure.
- Acid rain is caused by emissions of sulfur dioxide and nitrogen oxide, which react with the water molecules in the atmosphere to produce acids.

Greenhouse effect

- The greenhouse effect is a natural process that warms the Earth's surface. When the Sun's energy reaches the Earth's atmosphere, some of it is reflected back to space and the rest is absorbed and re-radiated by greenhouse gases.
- Greenhouse gases include water vapour, carbon dioxide, methane, nitrous oxide, ozone and some artificial chemicals such as chlorofluorocarbons (CFCs).
- The absorbed energy warms the atmosphere and the surface of the Earth. This process maintains the Earth's temperature at around 33 degrees Celsius warmer than it would otherwise be, allowing life on Earth to exist.

Ozone layer depletion

- The emission of ODS ("ozone-***depleting*** substances") account for roughly 90% of total depletion of ozone layer in stratosphere. These gases are carried to the stratosphere layer of atmosphere where ultraviolet radiations from the sun break them to release chlorine (from CFCs) and bromine (from methyl bromide and halons).
- The Impacts of Ozone Depletion: Stratospheric ozone filters out most of the sun's potentially harmful shortwave ultraviolet (UV) radiation. If this ozone becomes depleted, then more UV rays will reach the earth.

3.What is global warming and its effects. [2015(w)]

Ans: It is defined as the increase in temperature of the earth which causes more changes in climate.

- Mainly it creates by the green house gases.
- The green house gases absorb and hold heat from the sun, preventing it from escaping back into the space ,much like a green house absorbs and hold heat from the sun.

Effects of global warming:

- More heat wave.
- Expansion of desert area.
- Natural fires in forest land.
- Changes in pattern of rain fall.
- Rise in sea level.
- More cloud formation in the atmosphere.
- More evaporation of water.
- Disruption in firming.
- More drought.

Chapter-04

Short type

1. **What are endangered species? Give examples. (S-16)**

Ans :- **Endangered Species :-** A species is said to be endangered when it is facing extremely high risk of extinction in in the wild in near future ans whose survival is unlikely if factors like hunting, habitat loss continues to operate.List of endangered species also include those animals which may possibly be extinct but have seen in the wild in the last 50 years.

Medium type

1. **Give a comparison between ex-situ and in-situ conservation. (S-16)**

Conservation of biodiversity and genetic resources is an important phenomenon. Mainly the conservation of biodiversity and genetic resources has two strategies. If the conservation has been done in the natural populations of plant or animal species, then it is said "*In-situ* conservation" and if it is done outside of its natural habitat, then it is called "*Ex-situ* conservation". However, both methods are essential for the protection of animal and plant species.

- In-situ conservation is done in the natural habitats of the biodiversity components while ex-situ conservation is done outside of their natural habitats.
- In-situ conservation is more dynamic, whereas ex-situ conservation is more static.
- In-situ conservation involves designation, management, and monitoring of target taxa in their natural habitats, whereas ex-situ conservation involves sampling, transfer, and storage of target taxa from their natural habitats.
- In In-situ conservation, populations remain within the ecosystem involving the process of evolution whereas, in ex-situ conservation, they are not involving the natural evolution process.
- In-situ conservation is time consuming but more sustainable while ex-situ conservation methods are aimed to use in conserving genetic components, in immediate occasions.

Long type

1. **What are major causes and issues related to threats to bio-diversity? (S-16)**

Biodiversity is under serious threats as a result of human activity.The major threats of biodiversity are :-

Habitat loss :-

- Habitat loss is one of the biggest threats to biodiversity. Clear cutting forest to creat fields, filling wet lands to build houses and creating dam that change river flow are examples of habitat destruction.
- The rapidly growing human population is putting more and more pressure on existing habitats.

Poaching of Wild Life :-

- Another major problem is the poaching and killing of animal and birds.Many species of animal and birds are hunted for their fleshes,skins,fuss,feather,bones,horns....etc
- This unjustified killing is going on even today.

Man wildlife conflicts :-

- There are about 1,50,000 species of living organism in the world and India possessed about 75,000 species of animal.
- The illegal poaching and unauthorized hunting has harmed the living organism.
- There is a conflict between biodiversity conservator and general public because the public is not taking interest in wildlife management.

2. What is disaster management. How disaster management helps in case of floods.[2015(w)]

ANS: Disaster Management can be defined as the organization and management of resources and responsibilities for dealing with all humanitarian aspects of emergencies, in particular preparedness, response and recovery in order to lessen the impact of disasters.

Preparing for a Flood:

- Contact the local geologist or town planning department or meteorology department to find out if your home is located in a flash flood prone area or landslide prone area.
- Learn about your community's emergency plans, warning signals, evacuation routes, and locations of emergency shelters.
- Plan and practice a flood evacuation route with your family. Ask an out of state relative or friend to be the "family contact" in case your family is separated during a flood. Make sure everyone in your family knows the name, address, and phone number of this contact person.
- Post emergency phone numbers at every phone.
- Inform local authorities about any special needs, i.e., elderly or bedridden people, or anyone with a disability.
- Identify potential home hazards and know how to secure or protect them before the flood strikes. Be prepared to turn off electrical power when there is standing water, fallen power lines etc. Turn off gas and water supplies before you evacuate. Secure structurally unstable building materials.
- Buy a fire extinguisher and make sure your family knows where it is and how to use it.
- Buy and install sump pumps with backup power.
- Have a licensed electrician to raise electric components (switches, sockets, circuit breakers and wiring) at least 12" above your home's projected flood elevation.
- For drains, toilets, and other sewer connections, install backflow valves or plugs to prevent flood waters from entering.

Preparing to Evacuate:

- Fill your vehicle's gas tank and make sure the emergency kit for your car is ready.
- If no vehicle is available, make arrangements with friends or family for transportation.
- Fill your clean water containers.
- Review your emergency plans and supplies, checking to see if any items are missing.
- Tune in the radio or television for weather updates.
- Listen for disaster sirens and warning signals.

Chapter-05

Short type

1. Define thermal pollution. (S-16)

Ans:-

The discharge of warm water into a river is usually called a **thermal pollution.**It occurs when an industry removes water from a source, uses the water for cooling purposes and then returns the heated water to its source.

2. What is secondary pollutants . [2015(W)]

Ans: secondary pollutants are the ones that are formed in the atmosphere through chemical and photochemical reactions from the primary pollutants.

Examples-Sulphuric acid ,Nitrogen dioxide, ozone etc.

3. What is sound power level. [2015(W)]

Ans: The total sound energy emitted by a source. per unit time is the sound power or sound power level**.**. All share as level the same unit of measure: the decibel (dB).

4. What is environmental pollution. [2015(w)]

Ans: Environmental pollution is the introduction of contaminants into the natural environment that causes adverse change. Pollution can take place the form of chemical substances or energy, such as noise, heat or light.

Medium type

1. Write the various approaches to control soil pollution. (S-16)

There are many factors which control the soil pollution :-

- Limited use of fertilizers and pesticides.
- The grazing must be controlled and forest management should be done properly.
- The aforestation and reforestation must be done.
- In area of wind erosion wind breaks and shield must be used.
- The soil binding grass must be planted and larger trees must be placed along the banks.
- The industrial waste must be dumped in the low lying areas.
- The mining way must be improved along with their transportation.
- The area must not be left barren and dry.

2. Write the case study of Chernobyl nuclear hazard. (S-16)

- The Chernobyl accident in 1986 was the result of a flawed reactor design that was operated with inadequately trained personnel.
- The resulting steam explosion and fires released at least 5% of the radioactive reactor core into the atmosphere and downwind – some 5200 PBq (I-131 eq).
- Two Chernobyl plant workers died on the night of the accident, and a further 28 people died within a few weeks as a result of acute radiation poisoning.
- UNSCEAR says that apart from increased thyroid cancers, "there is no evidence of a major public health impact attributable to radiation exposure 20 years after the accident."
- Resettlement of areas from which people were relocated is ongoing. In 2011 Chernobyl was officially declared a tourist attraction.

Long type

1. Explain the methods of disposal of solid waste. (S-19)

Ans:- Methods of Solid waste disposal are :

- Open burning
- Dumping into the sea
- Sanitary Landfills
- Incineration
- Composting
- Ploughing in fields
- Hog feeding
- Grinding and discharging into sewers
- Salvaging
- Fermentation and biological digestion

Disposal of solid waste is done most commonly through a sanitary landfill or through incineration.

A modern sanitary landfill is a depression in an impermeable soil layer that is lined with an impermeable membrane. The three key characteristics of a municipal sanitary landfill that distinguish it from an open dump are:

• Solid waste is placed in a suitably selected and prepared landfill site in a carefully prescribed manner.

• The waste material is spread out and compacted with appropriate heavy machinery.

• The waste is covered each day with a layer of compacted soil.

1. Write the role of an individual in prevention of pollution. (S-16)

- Develop respect or reverence for all forms of life.
- Try to plant trees wherever you can and more importantly take care of them. They reduce air pollution.
- Reduce the use of wood and paper products wherever possible. Manufacturing paper leads to pollution and loss of forests which releases oxygen and takes up carbon dioxide. Try to recycle paper products and use recycled paper wherever possible.
- From the mail you receive reuse as many envelopes that you can.
- Do not buy furniture, doors, window frames made from tropical hardwoods such as teak and mahogany. These are forest based.
- Help in restoring a degraded area near your home or join in an aforestation program.
- Use pesticides in your home only when absolutely necessary and use them in as small amounts as necessary. Some insect species help to keep a check on the populations of pest species.
- Advocate organic farming by asking your grocery store to stock vegetables and fruits grown by an organic method. This will automatically help to reduce the use of pesticides.
- Reduce the use of fossil fuels by either walking up a short distance using a car pool, sharing a bike or using public transport. This reduces air pollution.
- Don’t use aerosol spray products and commercial room air fresheners. They damage the ozone layer.

2. What are various types of pollutants. [2015(W)]

Ans:

(i)Soil Pollutants

Soil pollution is the pollution of the Earth's land surfaces. The most common types of soil pollutants are heavy metals such as cadmium, chromium, copper, zinc or mercury, pesticides or herbicides, organic chemicals, oils and tars, explosive or toxic gases, combustible or radioactive materials, biologically active compounds and asbestos. These types of pollutants can enter the soil through poor agricultural practices, mining or the improper or illegal dumping of household or industrial waste materials.

(ii)Air Pollutants

Air pollution is the pollution of the Earth's atmosphere. The air pollutants include ozone, particulate matter, carbon monoxide, nitrogen oxides, sulphur dioxide and lead. These and other air pollutants typically enter the atmosphere through industrial processes related to the generation of heat and power, incineration of solid wastes and transportation.

(iii)Water Pollutants

Water pollution is the pollution of the Earth's oceans and other water sources. The common types of water pollutants include mercury, nitrates, phosphorous and bacterial pollution. These and other types of pollutants enter the water supply through industrial waste runoff, sewage treatment plants, urban and agricultural runoff and the illegal dumping of solid waste.

(iv)Noise Pollutants

Noise pollution is a form of air pollution related specifically to the types of sound present in the atmosphere. The Environmental Protection Agency defines a noise pollutant as any sound that interferes with normal activities or disrupts or diminishes one's quality of life. Noise pollutants can be present in the home, school, work or the community at large. Different types of noise pollutants may include sounds generated by aircraft, trains, boats, automobile traffic, construction, industrial manufacturing, vehicle alarms or even loud music.

3. Explain the drawbacks of nuclear power and environmental impacts.[2012(w),2015(w)]

Ans: The drawbacks of nuclear power and environmental impacts are as follows:

(I) Misuse of nuclear technology:
The technology used for generating nuclear power can also be used to produce nuclear weapons. Left in the wrong hands, such as terrorist or extremist groups, nuclear technology could lay the foundations of global disaster.

(II) Radioactive waste:
Although gaseous exhausts from a nuclear reactor are environment-friendly, solid waste products generated in the same, which are radio-active, cause more long term problems than the waste material generated by conventional fuels. The radio-active by-products can pollute the environment beyond repair and cause diseases, such as cancer, in the human population .

(III) Tragic accidents:

Accidents in nuclear reactors are much more devastating than those in conventional energy plants. Despite being a much rarer occurrence, individual nuclear disasters are much more deadly than say fossil fuel disasters.

(IV) High costs:

- The construction cost of a nuclear reactor is high.
- Long time line.
- Building a nuclear power plant takes a no. of years.
- Contamination perils.
- Uranium mining operations can turn out to be hazardous for the health of miners as well as the surrounding population. If necessary safety precautions are not observed, radio-active contamination can spread, even to the next generation.

Chapter-07

Short type

1. **What are the modes of transmission HIV virus? (S-16)**

Ans :- HIV remains in blood, sexual secretion and other body fluids of infected persons. The main modes of of transmission of HIV from person to other are by-

(i) sexual intercourse
(ii) transmission through blood transfusion, blood product and contaminated equipments
(iii) through infected mother to child.

Long Type

1. **What is population explosion. [2015(W)]**

Ans:

Population explosion refers to the rapid and dramatic rise in world population that has occurred over the last few hundred years.

Causes of Population explosion:

- Accelerating birth rate: Due to lack of awareness about the positive impact of using birth-control method, there has been a steady growth in birth rate.
- Decrease in infant mortality rate: An improvement in medical science and technology, wide usage of preventive drugs (vaccines), has reduced the infant mortality rate. There has been great improvement in medical and health-care facilities during the past few decades.
- Increase in life expectancy: Due to improved living conditions, better hygiene and sanitation habits, better nutrition, health education, etc. the average life expectancy of human population has improved significantly.

  Effect of Population explosion:

  - Over-population
  - Unemployment
  - Poverty
  - Illiteracy

- Poor Health
- Economy
- Pollution and Global warming

2. What is the role of information technology in environment and human health. [2019(s)]

Ans: The important role of information technology in environment and human health are as follows:

1. Remote Sensing: Remote sensing and Geographical Information System (GIS) has proved to be very effective tool in environment management. Now, the ongoing changes in the environment can be assessed easily through satellites by remote sensing techniques. The occurrence of a number of natural calamities like droughts, floods, volcanic eruptions etc., can also be predicted well in advance. Such assessments help the environmentalists and planners to take effective measure to minimize the effects of these extreme natural events. The Ministry of Environment and Forests, Government of India has created an information system called Environmental Information System (ENVIS) with its headquarters in Delhi. It provides a network database in environmental issues like pollution control, renewable energy, desertification, biodiversity etc.

2. Database: Database is the collection of interrelated data on various subjects in computerized form which can be retrieved whenever required. Now the data regarding birth and death rates, immunization and sanitation programs can be maintained more accurately than before in computers at health centres. Database is also available about the diseases like malaria, fluorosis, AIDS etc. The Ministry of Environment and Forests, Government of India has taken up the task of compiling a database on various environmental issues like wildlife, forests cover, wasteland etc.

3. Human health: Information technology also plays a key role in human health. It helps the doctors to monitor the health of people of that area. The information regarding outbreak of epidemic diseases from remote areas can be sent more quickly to the district administration to take corrective measures. Now, patients can seek help of a super specialist doctor placed at far off distance. Many hospitals now, take online help of experts to provide better treatment and services to their patients. This has become possible only because of advancement of IT in the recent times.

4. Online Information: It provides vast quantum of information on different subjects including human health and environment.