Ques

(I) What is Meant by Environment, What are its Objectives and Scope?

- Environment is taken from a French word 'Environ'/'Environner' which Means Encircle or Surround.
- Environment Means everything that effect an organism during its life time.
- It is defined as sum total of all the biotic and abiotic factors that surrounded an organism is called its Environment

Objectives

- Objective of environmental education are

i) Awareness :- To create an awareness and sensitivity to the total environment and its problems.

ii) Knowledge :- To help individuals to gain understanding about environment.

iii) Attitude :- To develope strong feeling of concern for the environment.

iv) Skill :- To help individuals acquire s... for solving environmental Problems.

v) Participation :- To creat an atmosphe... so that people participate in dec... Making.

vi) Harmony :- To make nature and hum...

Need for public awareness :-

There is an chinese saying "If w... plan for one year, plant rice; if w... plan for ten years, grow trees; but... if we plan for hundred of ye... educate people about their envir... -ent". It Means if we want to Manage our Planet earth, we have to make the persons Environmentally Educated.

Scope and importance of environmental Science.

- Scopes are broad based

i) Natural resources and their conserva...

ii) Biodiversity and its Conservations.

iii) Control of Environmental Pollution.
iv) Stabilization of human population.
v) Development of Non polluting renewable resources.
vi) Green advocacy (Environmental Lawyers)
vii) Green Marketing (Environmental auditors)
viii) Green Media (Media, TV, Radio, Newspaper)

2) What are the different components/Segments of Environment?

- Environment has different components such as

i) Biosphere:- It includes all the plants and animals.

ii) Atmosphere:— Atmosphere is a gasous envelope in the atmosphere. It has following Layers

a) Troposphere.
b) Stratosphere.
c) Mesosphere.
d) Thermosphere.
e) Exosphere.

* Note - Need to explain atmosphere only in exam in this question.

iii) Hydrosphere :-
It is the part of the earth, where there is water. About 75% of the earth is the hydrosphere. It include sea, oceans, Rivers, Lakes, Glaciers as well as ground water.

iv) Lithosphere :- It is the part of the earth that is Made up of Rocks, Soils, Mineral.

Q(3) What do you Mean by atmosphere ? Segregate atmosphere on the basis of temperature, gradient and height.

- Atmosphere is the multilayered gaseous Mixture sorrounding the planet earth. It protects us from dangerous rays from the Sun by blocking them.
- It consists of Nitrogen (78%), oxygen(21% and other gases (1%)
- There are 4 different layers of atmosph

Characteristics of different layers of atmosphere

LAYER	HEIGHT	TEMPERATURE °C	ACTIVITIES
1) Troposphere	0 - 10 KM	15 to (- 55°C)	• Characterized by continuous decrease in temperature. • It is a layer of sulphate. • Also called as turbulent (अशांत) zone. • It is a zone of cloud formation. • Weather phenomenon occurs.
2) Stratosphere	10 - 40 KM	- 55 to 2.5°C	• Little increase in temperature. • Presence of ozone called as ozonosphere. • O_3 protects us from UV rays. • Quiescent (शांत) zone.
3) Mesosphere	42 to 95 KM	2 to - 95°C	• Characterized by cold temperature. • Low pressure. • Least studied.
4) Thermosphere	95 to 500 KM	- 95°C to 1200°C	• High temperature. • Thin air. • Ionisation of gaseous such as O_2, NO_2 so also called as ionosphere.
5) Exosphere	Above 500 to 32910 KM.	Above 1200°C	• It is the outer space • Gravitational pull of the earth not work.

Ecosystem :-

What do you Mean by ecosystem? write in details about its structure.

OR

What do you Mean by ecosystem? write in details about its components / Factors.

- Ecosystem is used first time by A.G. Tansley 1935. It is defined as a self regulating system that consists of biotic and abiotic factors which are interacting with one another and exchanging energy and matter.
- Types of ecosystem

a) Forest ecosystem
b) Grassland ecosystem.
c) Pond ecosystem
d) Mountain ecosystem.
e) Desert ecosystem.

Each one of above is made up of biotic (Living) and abiotic (Nonliving) factors.

Ques
Q) What do you Mean by environment. ? What are the types of environment. ?

- Environment Means Sorrounding.
- Everything that sorrounds an oreganism affects is called environment.

There are two types of Environment.

i) Geographical Environment / Natural Env.

ii) Man Made environment. / Artificial.

i) Geographical environment : It includes all the natural resources, Mountai Land, Water, desert, ocean etc.

ii) Man made environment / Artificial en It is created by Man. It has two pa

a) Inner :- It is also called as socia environment.

b) Outer :- It consists of the basic such as transport, Communication, etc.

Structure of ecosystem

- Structure of ecosystem made of two components.

a) Biotic components :- It includes all living organisms. and is of following types.

i) Producers :- Also called as Autotrophs. because they produce their own food by the process photosynthesis. Examples all green plants and trees.

ii) Consumers :- These organisms get their food by feeding on others. They are again of different types.

a) Herbivores :- Plant eaters eg. cow, deer, Elephants.

b) Carnivores :- Meat eaters. eg. Lion, Tiger, Wolf.

c) Omnivores :- That eat all plants and Meat. eg. Man, birds etc.

d) Detritivores :- Those organisms who eat dead and decaying body parts of plants and animals. ex Ants, Earthworms, Spider, Termites etc.

iii) Decomposers / Micro organisms :—

Those Micro-organisms who break down the body parts of Plants and animals and converted them into simple inorganic Minerals
eg. Bacteria, Fungi

Abiotic components

b) Abiotic :- It include

i) Physical components :- Air, water, Soil light, wind, velocity, water current altitude, Latitude etc.

ii) Chemical components :- 'C', 'N', H, S, K, Na, Fe, Cu and all the toxic substances.

Ans) What do you Mean by food chain? Write about different types of food chain you studies.

- Food chain is the linear sequence of orga -sm where one organism eats others and also being eaten by others.
- Examples of food chain

i) Grass → insect → Frog → Snake → Eagle.

ii) Tree → Deer → Lion

iii) Phytoplanktons → Zooplanktons → Small
↓
Big fish

- There are three (3) types of food chain

a) **Grazing Food chain** :- It starts from Producers and ends to Carnivores.

ex:- Producer (Green plants) → Herbivores (Goat) → Carnivores (Lion)

b) **Parasitic Food chain** :- It starts from Producers and ends to Parasites.

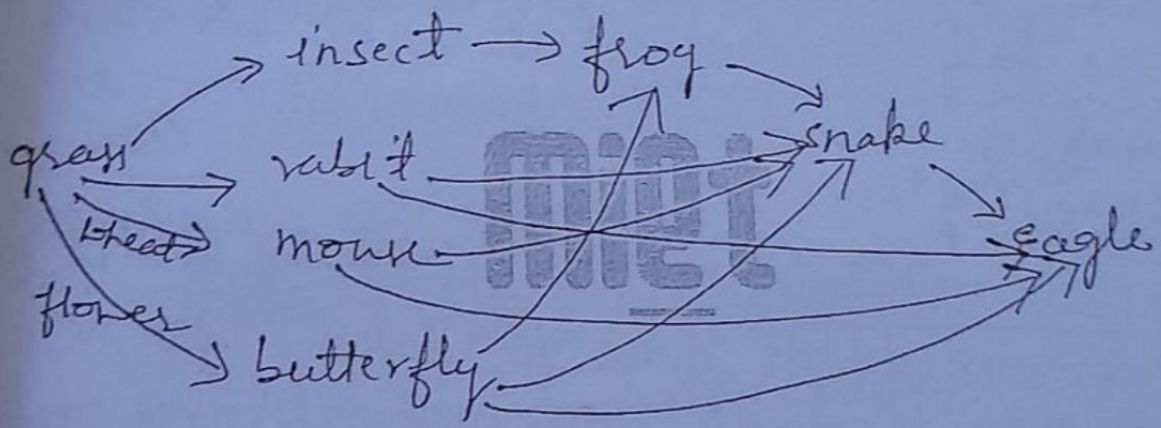
ex:- Producers (Tree) → Herbivores (Fruit eating birds) → Parasites (Lice)

c) **Detritous Food Chain** :- It starts from Detritous and ends to detritivorous organisms. The organisms of this food chain are insects, algae, bacteria, protozoa etc.

ex:- Dead Organic Matter ⇒ Bacteria/beetle
↓
protozoa/spider

What do you mean by food web? Define it with the neat diagram. (खाद्य श्रृंखला)

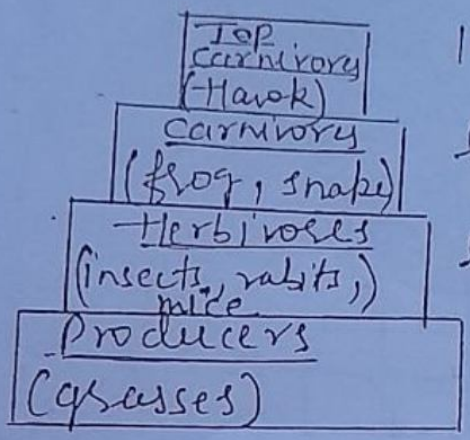
- When different types of food chains combined together and form a complex web (जाल) like structure is called food web.
- It is not a linear sequence like a food chain but a complex (जटिल) structure



What are ecological pyramids. Explain all of them with a neat sketch

Ecological pyramids are geometrical arrangement of trophic structure of an ecosystem where producers come at base and consumers come at the top. There are 3 types of Ecological pyramids

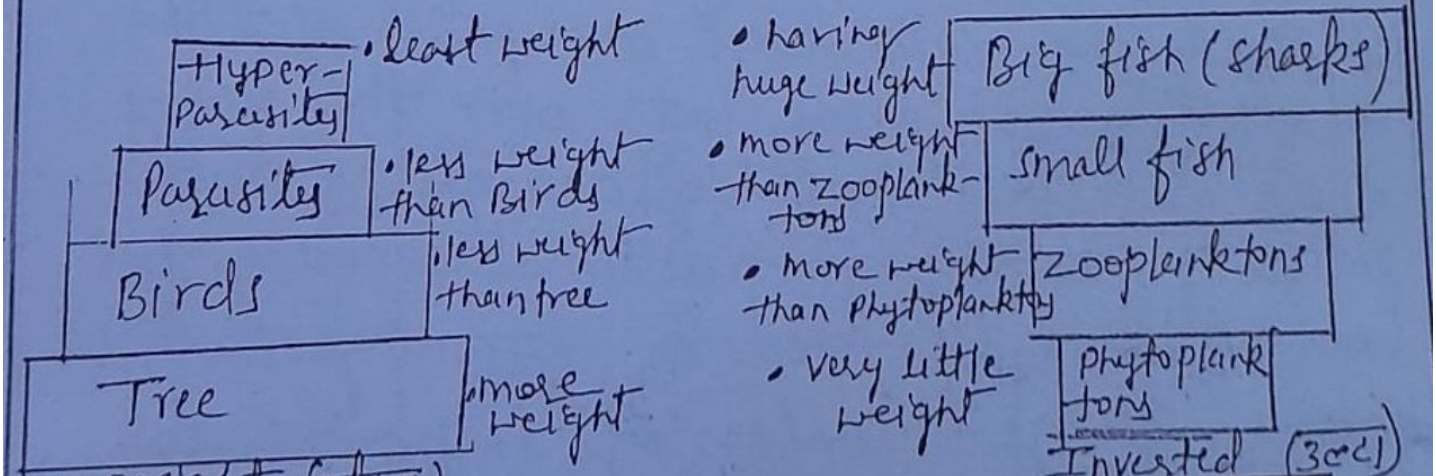
1. Pyramid of Number: They show relation between Producers, consumers ~~and~~ on the basis of their numbers. They may be upright & Inverted



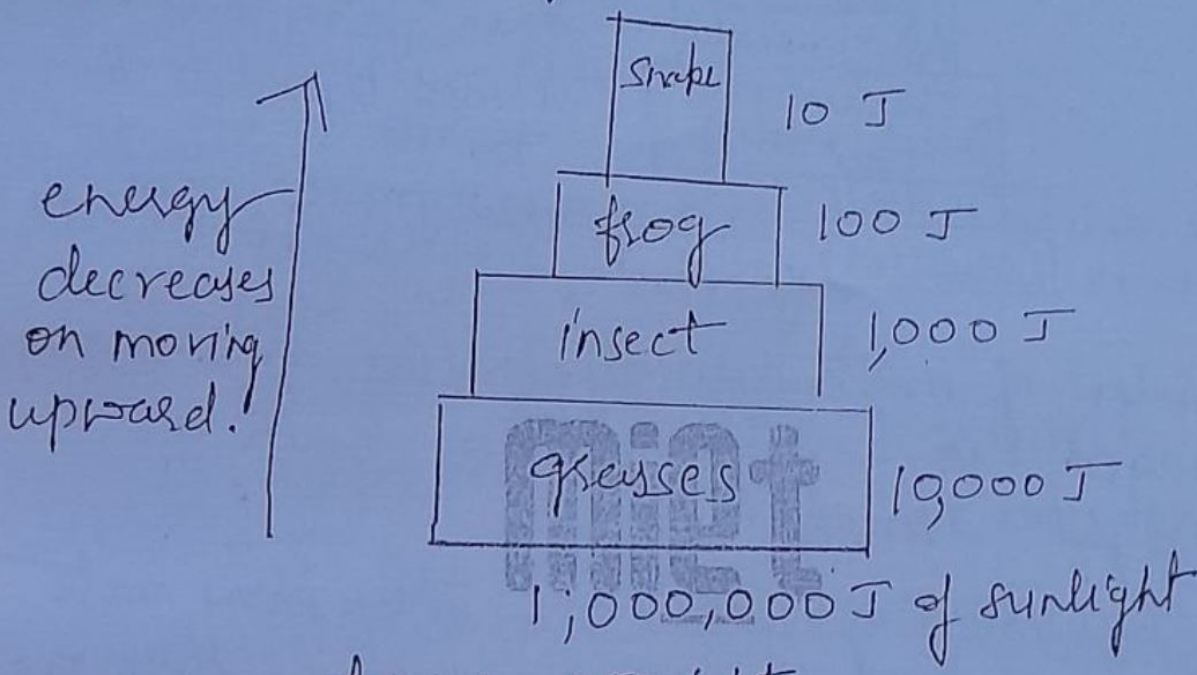
least (सबसे कम) Hawk
least frog, snake than Herbivores
less insects, rabits than grasses
more grasses

Number of organisms decreasing as we more upward in ecosystem. So gain a upright structure.

2. Pyramid of Biomass: They show rate of Biomass (weigh) of organisms. They may be upright and inverted in shapes.



3. Pyramid of Energy: It is on the basis of flow of energy. It may be upright only not / never inverted as rate of flow of energy always decreases when we move upward in ecosystem.



always upright

Ques 8) What are the impacts of Modern agriculture on environment?

Ans. Agriculture is the oldest occupation of the people in rural areas, but over the years there have been notable changes in the pattern of Farming. Traditional farming has been replaced by Modern farming that is having large number of impacts on environments.

Impacts of Fertilizers (खाद के प्रभाव)

a) Micronutrient Imbalance :- We are adding Nitrate, Phosphate, Potassium in the fields ignoring zinc, boron, manganese that is affecting the soil fertility.

b) Nitrate pollution: The fertilizer we have been using polluting the ground water also and causing a disease called Blue baby syndrome. It occurs when we drink the ground water having more than 25 mg/l of NO_3.

c) Eutrophication: Large no. of fertil from our fields move to lakes, ponds sea through runoff. These fertilizers reaching to water bodies, degrade the quality of water. It causes increased amo of green algae, that reduces O_2 and thus kill fishes.

Pesticides related Problems

a) Creating resistance in pest: Pest not killed by spraying pesticides, making them super pests.

b) Death of non-target species: Pesticides harm the non-target organisms also which are useful to us.

c) Biological magnification :- Many pesticidy not degrade but accumulated (संचय) at the top of food chain (10 times at every next step in food chain). Which is harmful.

grass → insect → sparrow
0.25 mg/l (DDT) → 2.5 mg/l (DDT) → 25.0 mg/l (DDT)

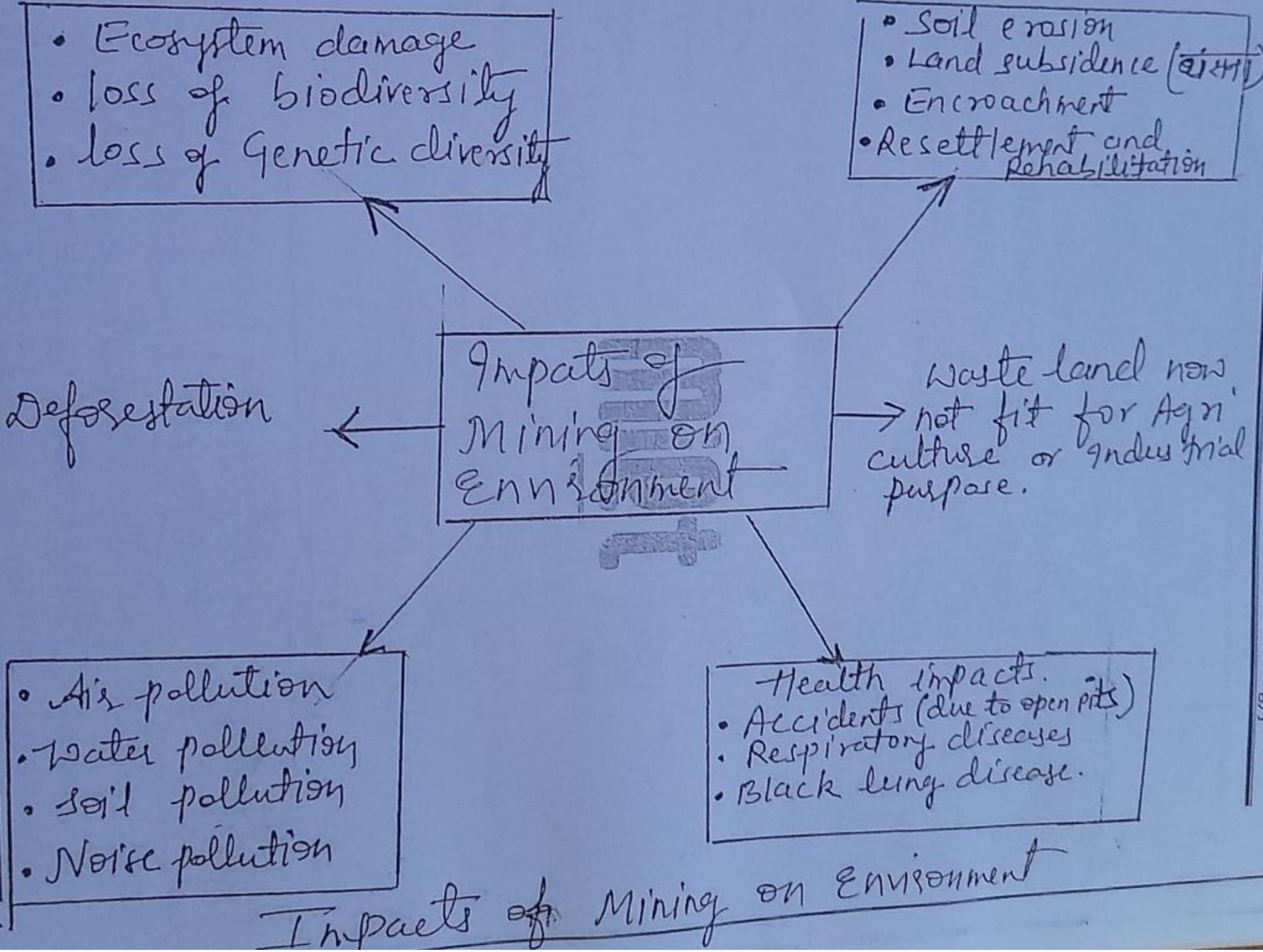
Problem related to over irrigation

a) Water logging :- (more water content in soil)

Due to wrong irrigation methods soil get fully soaked (wet) in water, due to which crop production falls.

Q10) Write in detail about the impacts of mining (खनन) on environment.

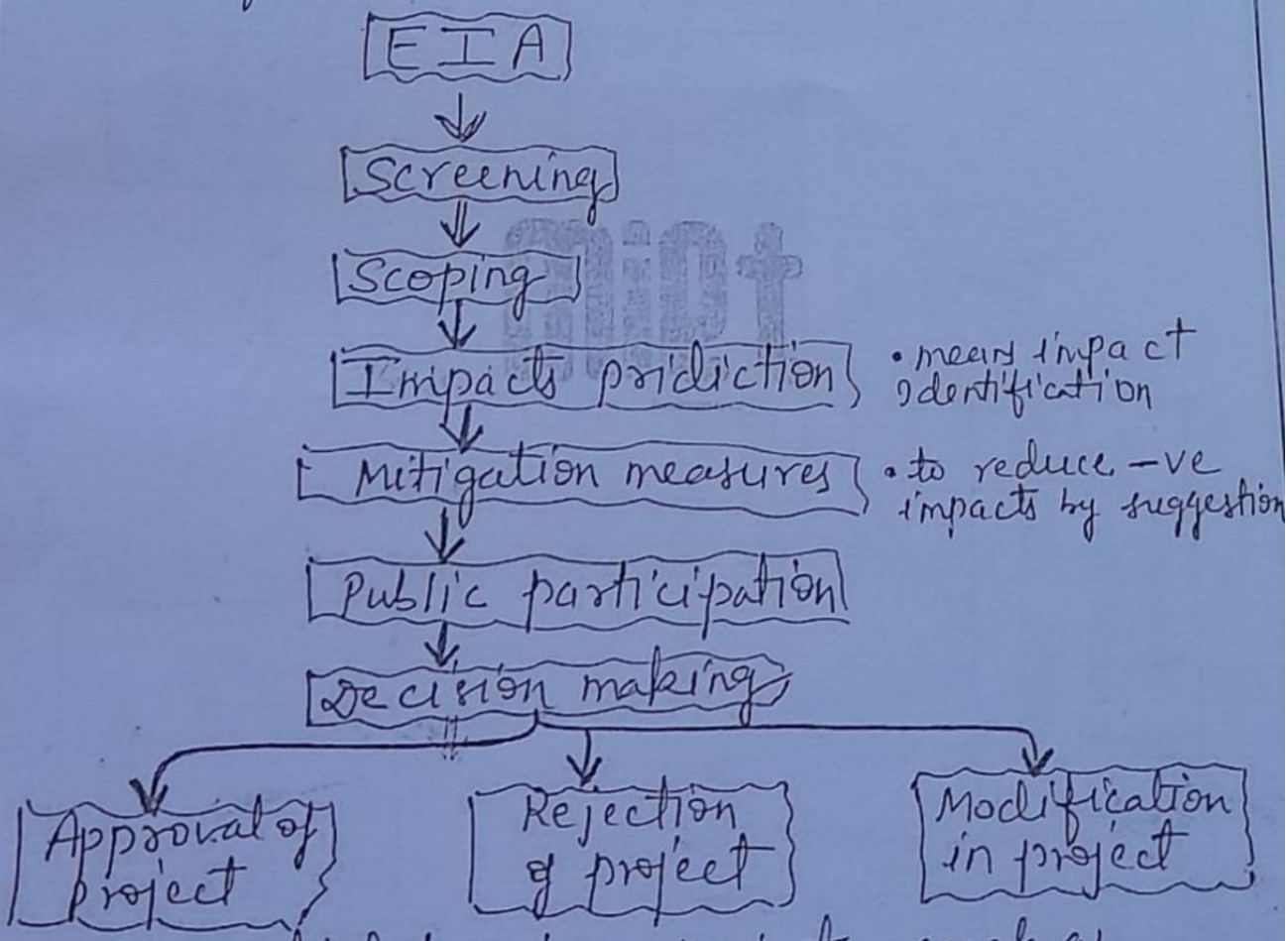
Ans. Mining is done to extract minerals from the deep earth. It has following impacts on environment:



Impacts of Mining on Environment

(Q11) What do you mean by EIA. Write the whole phenomenon of EIA.

Ans. EIA refers to Environmental Impact Assessment. It is an exercise carrying before any major project or activity so that it cannot harm the environment on long and short term basis. Its methodology is as follows:



It is applied for big projects such as

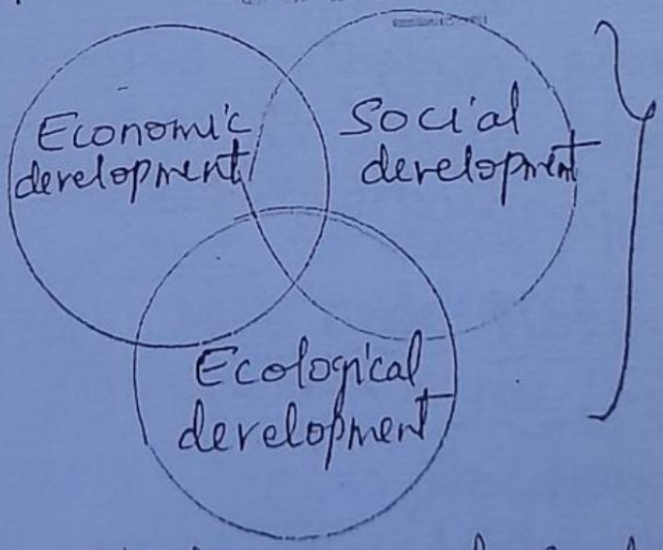
- developing cities, town
- Big Dams
- Mining sector
- Highways
- Airports
- Harbours
- Nuclear plants
- Industries
- Railways

(Q11) What is sustainable development? What measures would you suggest to achieve goals of SD

Ans. Sustainable development means meeting the needs of present generation without harming the needs of future generation.

Objectives of Sustainable development

- To bring benefits to all.
- To provide basic facilities to all people
- To reduce pollution
- To reduce soil erosion.
- To increase forest cover
- To reduce waste generation
- Sustainable use of natural resources
- To develop better relation between human and other



development in all spheres.

Factors affecting Sustainable Development

- Increasing population
- Exploitation of Natural Resources

- Pollution
- Poverty
- False beliefs, old customs, ill thoughts

To face these challanges everyone should work for the sustainable development.

Measures to achieve Sustainable development

1. Using appropriate, ecofriendly technology
2. Reduce, reuse, recycle approach
3. Promoting environmental education
4. Resources utilization to fulfill the needs not greed.
5. Use of less resource and to produce minimum waste.

UNIT-2

① What is deforestation? Discuss various causes of deforestation. Give the remedial measures to conserve the forest resources.

- Forests are one of the most important natural resource on the earth. Forest provide the earth with green cover.

Uses of Forest

a) Commercial uses :- We get different types of products such as timber, Rubber, Medicine, Gum, Resins, fibers, Fodder, fuel etc. from the forest.

b) Ecological uses :-

- Forest Provide us Oxygen.
- They reduce global warming by absorbing Carbon dioxide.
- They reduce pollution. So called as pollution Moderator.
- Forest bring us rain.
- They recharge the ground water.
- They reduce soil erosion.
- They improve soil fertility.
- They provides home to millions of species.

They help to conserve species and genetic diversity.

Causes of deforestation:-

: Deforestation is cutting of trees and using the forested land for non forest purpose. Various causes of deforestation are.

- Shifting agriculture/Zhoom cultivation is the Major cause of deforestation
- Fuel wood requirement
- Wood requirement for industries.
- Wood requirement for major development programmes such as dam constructions, Railways etc.
- Overgrazing.
- Forest fires.
- Insects and Pests
- Bad weather conditions
- Acid rain.

Remedial Measures For the Conservation of Forest.

i) Forest conservation act 1980 Played an impor

role to conserve forest.

ii) Banned on shifting cultivation.

iii) Establishing national parks and biosphere reserves which strictly prohibit the commercial exploitation of forest resources.

iv) Chipko Movement started in hilly areas of Uttarakhand in 1973. It was led by illitrate women whose philosophy was very simple that forest not only give us food but also Fodder, Fiber, Fertilizer, food but also help in making our air, water and soil (हवा) This philosophy made this movement popular in different parts of the world as well

v) social forestry

vi) Agroforestry.

2) Write a note on water resource and impact of over exploitation of water resources on environment

OR

Write a detailed note on water crisis. Illustrate any three examples showing fighting for water resources.

Water has no alternatives. It is also known as "Life". It is essential for all living organism including plant, animals and men.

It is also the bases for every human activity like agriculture, housing, industries etc

Availability of water

- About 97% of earth's water is on ocean.
- Remaining 2.3% is locked in glaciers.
- The balanced 0.7% is available as fresh water.
- From the annual rainfall 70% of water lost by evaporation
- Remaining 30% run off and goes into rivers and oceans.

Impacts of over exploitation of water resources

- Water pollution, that made surface and ground water resources are unfit for drinking.
- Water born diseases:- Like Cholera, typhoid, Amoebiasis, dysentry.
- Water induced diseases:- Malaria, Filaria, dengue, Flourosis, Arsinecosis.

- subsidence.
- Reduced ground water level.
- Shortage of fresh water / water crisis.
- Fighting for water resource

Fighting for water resources is common between cities, villages, different parts of the country. For example

(i) Fight between Karnataka and Tamil nadu for river Kavery.

(ii) Fight between punjab and Haryana for Sateluj and yamuna link canal.

(iii) Fight among different countries in Middle east. The countries like Soudi Arabia, Israel, Iraq, Iran, ~~for~~ Turkey Jorden have been fighting for the three water resources like Jorden river, Nile river and Tigris Euphrate river.

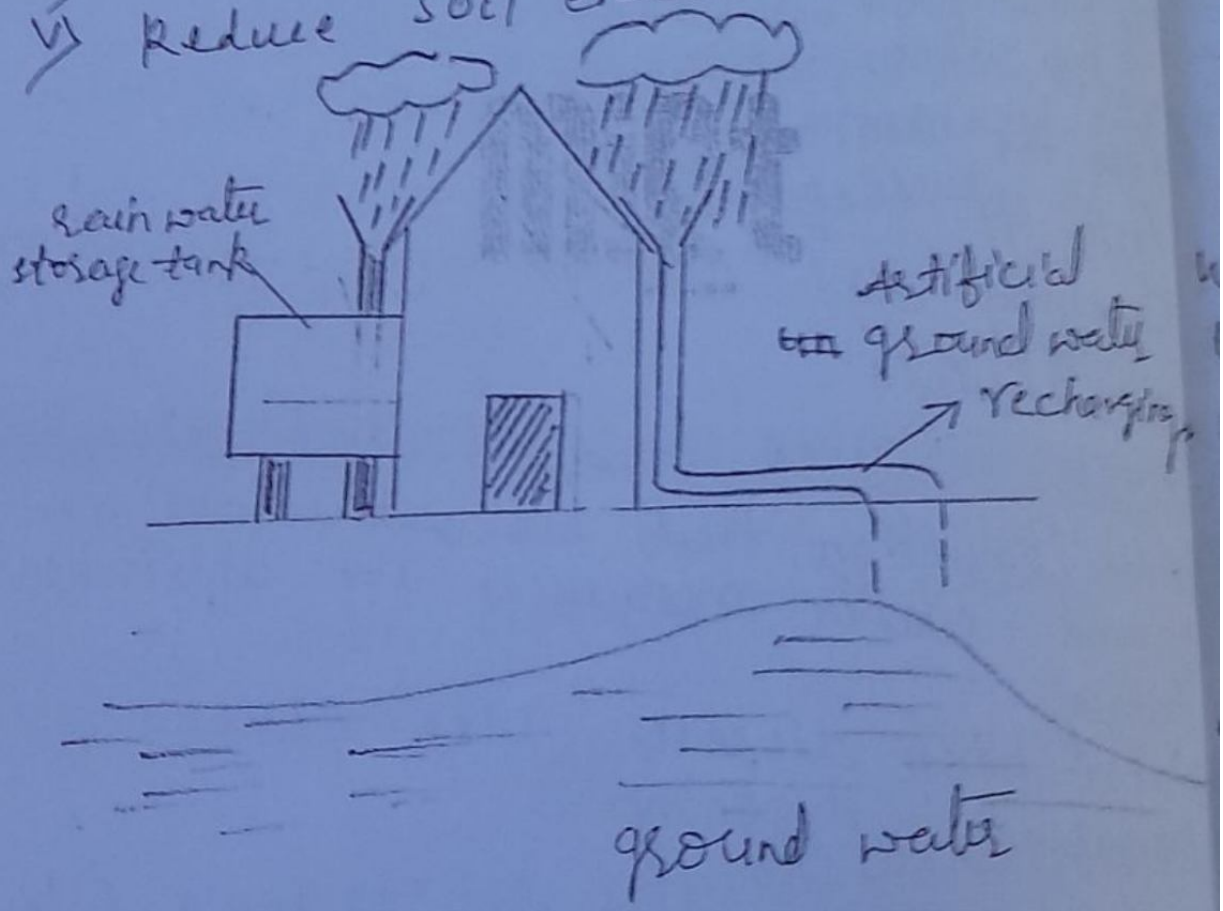
3) Write a detailed note on water conservation.

- Water is an important natural resource without which life is not possible.
- According to United nations due to over exploitation of water resources, this resource is under pressure. The world is heading towards water crisis.
- 80 nations including India is in grip of "Water stress".
- Time is not far when we thought water is available in abundance will be a scarce commodity.
- The main approaches for conservation of water resources are.

a) Conservation in agriculture Sector:- Huge amount of water resource has been utilizing in this seetor. Agriculture, industr can conserve a lot of water by using efficient irrigation Methods Such as drip irrigation, Sprinkler irrigation.

b) Second user of water is Industry which ca reuse the Industrial waste water after treatment.

- We can also conserve the water by using rain water harvesting technology. A rain can be stored for the later use.
- Advantages of rain water harvesting:
  i) It can conserve water.
  ii) Increase availability of water.
  iii) Check declining of ground water.
  iv) Improve quality of ground water.
  v) Reduce soil erroxion.



(Rain water harvesting diagramme)

Contour farming in hilly areas.
Terrace farming.
Water conservation at homes like
i) Check the hidden leakages.
ii) Take short showers.
iii) Turn off the taps after toothbrush. get wet.
iv) Watering the plants in evening or when it is not windy.
v) Grow drough resistance variety of crops.

Write any of the three (3) water born and water induced diseases.

i) Cholera

Pathogen :- Vibrio Cholerae

Mode of infection :- Water born and food born

- cholera is termed as a disease of poor people. In india where lot of people gathered in the events like kumbha mela is major cause of spreading this diseas

- Symptoms :- Vomiting, Loose motion, tiredness, Muscular cramps and dehydration.
- Treatment :- Rehydration with ORS,
  :- Improvement of sanitary facilities
  :- Health awareness
  :- Availability of safe drinking water to all.

ii) Typhoid.

Pathogen :- Salmonella typhi
Mode of infection :- Water born
Symptoms :- High fever, headach, Wounds in Small intestine, liver. Muscular. Cramb and weakness, Loss of appetite

Treatment :- Antibiotic treatment.
→ Availability of safe drinking wat for all.
→ Washing our fruit / vegetables properly before eating.

iii) Amoebiasis

Pathogen :- Entamoeba histolytica
Mode of infection :- Water born
Symptoms :- Liquid stool with mucus and blood

→ Indigestion
→ Weakness etc

Treatment :-
i) Sanitary disposal of human excreta.
ii) Water should be boiled before drinking.
iii) Washing vegetables and fruits properly.
iv) The Medicines given are
a) Entrozyme, trinidazole, furamide.

Water Induced diseases

These diseases not directly related to drinking water but water is one of the factor for causing these diseases.

i) Malaria

Pathogen :- Female Anopheles Mosquito.
Mode of infection :- Water induced.
Symptoms :- High fever, terminated with
Sweating
- Chilling.
- headach.

Treatment :- Drug Chloroquine is prescribed by the doctors.

→ spraying pesticides to kill Mosquito
→ Using Mosquito net, Mosquito rep.
→ Avoid stagnation of water around our environment.
→ A fish Gambusia affinis to eat mosquito larvae.

(ii) Dengue.

Pathogen:- Aedes Aegypti
Mode of infection:- Water induced disea
symptoms:- High grade fever, Shiver, headach, bleeding from Gum.
Treatment:- platelets transfusion, Anti treatment.

(iii) Fluorosis

- Fluorosis caused when a people are exposed to drinking wa having fluoride content more than 1 ppm.
- symptoms:- Tooth decay, Bone deformities.

- Pain in back
- Stiff back and hump back.
- Pain in joints.
- Cattles also having same symptoms as humans.

Treatment :-

a) Defluoridation of water: By NEERI National Environmental Engineering Research Institute, Nagpur found easy method to remove Fl (fluorides) from water.

5) Write in brief about conventional / non renewable energy resources.

s. There are fossil fuel like crude oil, natural gas and coal which are formed by the decomposition of remains of plants and animals millions of years ago, they are non renewable and called as conventional resources of energy.

A) Coal :- Coal is 1000 times more than the total demand of global energy, but the problem is that we are exploiting it too much as per our demand. It is very precious fossil fuel so need to conserve it.

Coal is used for burning purposes and also source of making electricity in thermal power plants. But associated with some of the disadvantages like:

- non renewable
- not environment friendly
- polluting by emmitting SO_2
- Its mining is not safe.

(B) Petroleum: It is a crude oil and most of reserves as located in middle east. In India drilling of oil was first done in Digboi North east.

Its refining at different temperature and pressure provides many liquid fuels like kerosine, diesel and petrol.

But it is non renewable fossil fuel which is likely to exhausted in near future.

(C) Natural gas; It is a III rd major source of fossil fuel. It is in great demand due to its eco-friendly nature. It produces nil emission means no pollution. It consist of 95% methane and rest of ethane and propane.

(Q5) Write a brief not on non conventional source of energy.

OR

Renewable Energy Resources.

Ans (A) Solar energy - Sun is the all source of energy. Solar cell panels are used to convert this energy into electricity.

Advantages of solar energy:

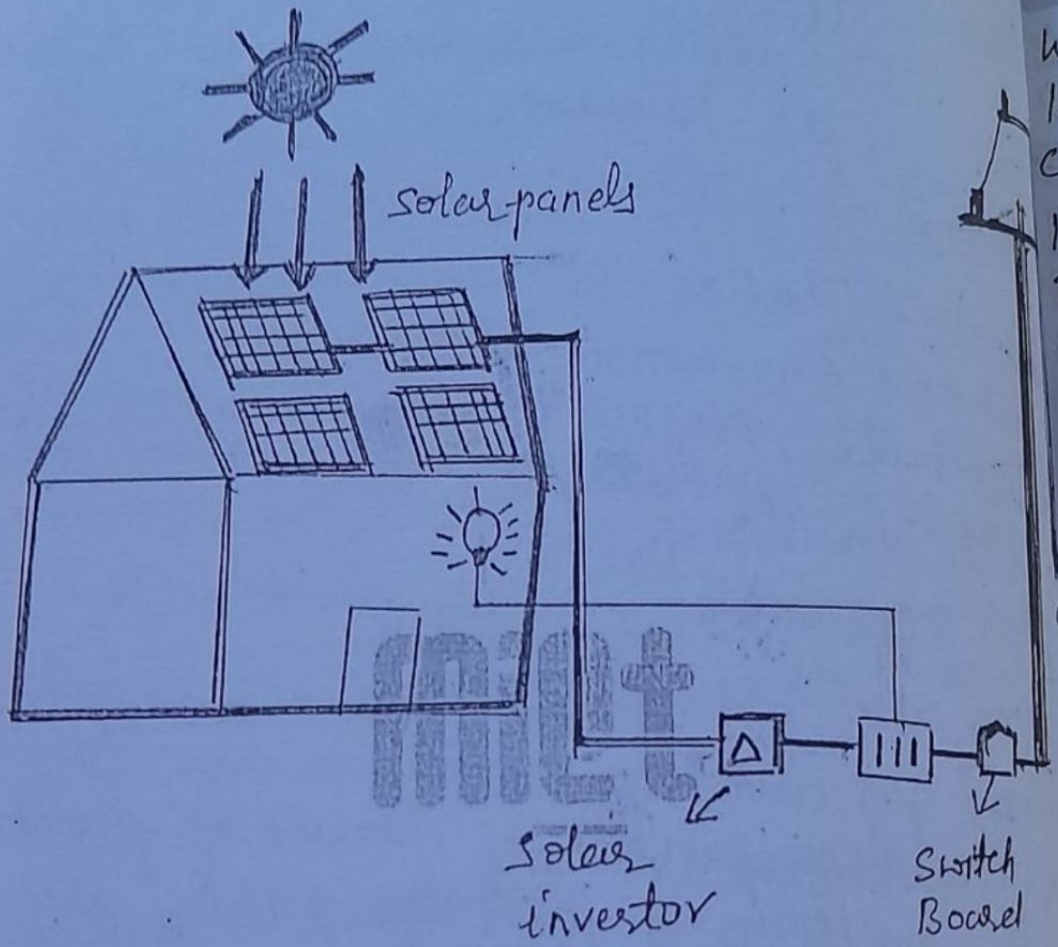
- Clean - It is non polluting energy not CO_2 emission like in case of fossil fuel.
- Renewable - There is an ample of energy on earth
- long life - Solar cells have a life of 30 - 35 years.
- Reliable - energy ~~of~~ stored in batteries.
- Free energy.
- Easy installation.

Disadvantages:

- We can not use solar cells at cloudy days, raining seasons and at night.
- To collect solar energy efficiently is a difficult task.

Application of solar energy

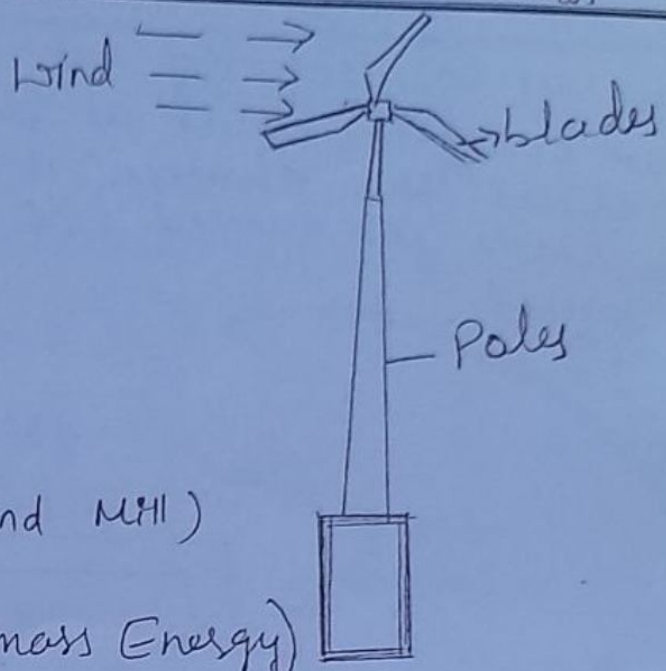
Solar heat can be used in solar cookers, solar dryers, solar water heater, solar watches etc.



Home Solar Power System

b) Wind energy :-

- Wind energy is a mature renewable energy source. It creates electricity by using kinetic energy created by air currents.
- In India, we have ~~himaly~~ himalayan region, Thar desert, coastal areas, where there is a certain velocity of wind is present, so we can use this energy efficiently to full fill our electricity demands.
- Advantages:
  i) Ecofriendly
  ii) No pollution
  iii) Renewable.
  iv) Can produce electricity to remote areas also
  v) Easy installation
- Disadvantages:
  i) Not suitable for every place as wind ~~[illegible]~~ Mills rotate with a wind of certain velocity only.
  ii) Installation of wind farms required large land area.
  iii) Wind Mills are huge, so they can interfere with the flight of migratory birds.



(Wind Mill)

c) Biogas:- (Biomass Energy)

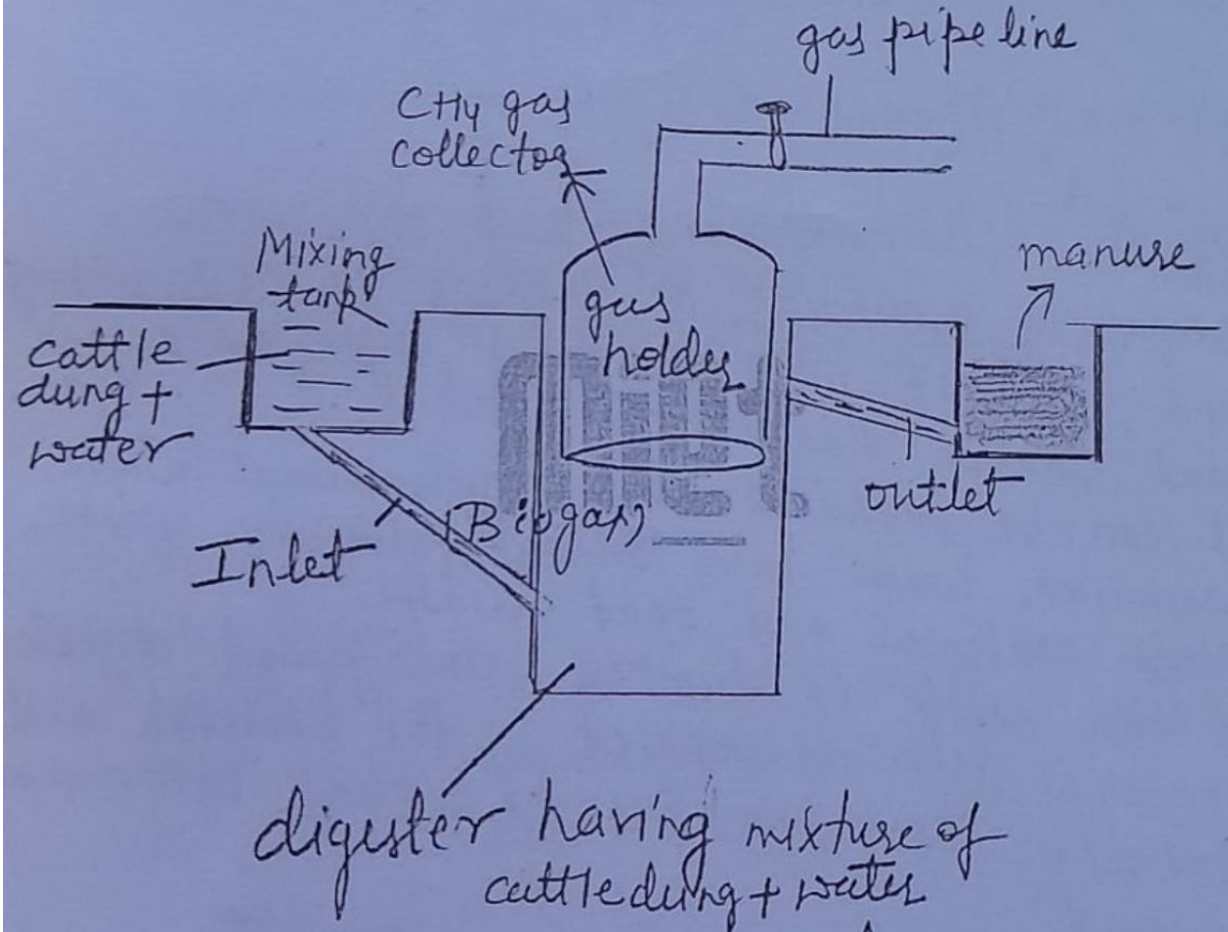
- Biogas is a mixture of Methane 50-80%, Nitrog 4%, H_2S 1% with traces of Hydrogen, Oxygen and Carbon dioxide.
- It can be produced from agricultural waste, Manmure, Waste from animals, domestic waste, Plant material and food waste
- All the waste is dumped underground digeste where it gets decomposed by the bacteria and producing Methane gas as a fuel for dom purposes.

Advantages:-

i) Ecofriendly.
ii) Renewable.
iii) Less Polluting.

iv) Can help in conserving our forest.

v) We are using the waste as a source of energy so reduces the chances of spreading disease as the waste get dumped into a closed container under ground.



digester having mixture of cattle dung + water

Biogas plant

q) Hydrogen energy :-

- Hydrogen is the clean fuel, having calorific 3 times than gasoline.
- Production of hydrogen fuel:-

Hydrogen is not available naturally in the quantities on the earth. Some Methods of Produ of Hydrogen are.

i) Burning of water at very high temperature
ii) Production through electrolysis.
iii) Extraction of H_2 from methane. (CH_4)

Advantages of H_2 as a fuel:-

i) on burning H_2, it emits only water vapour
ii) It does not produce CO_2 when it is burned
iii) Hydrogen as a fuel which has been using in Space crabt where the end products wo can be reused by crew members for dri purpose.
iv) It can run vehicles which are now a days running by fossil fuels.

Hydrogen as a fuel →
- Thermal power plants
- Industrial fuel
- Electricity making
- Domestic fuel
- Transportation

What do you mean by biogeochemical cycle/Material cycle?

OR

With a neat sketch explain all the steps of following Material cycles.

a) Nitrogen cycle.
b) Sulphur cycle
c) Carbon cycle.

:= Biogeochemical cycle:-

g. Nitrogen is an essential components for life processes. in biosphere. There is a continuous exchange of nitrogen within ecosystem. Plants can not use it in its natural form so N_2 Must be converted into NH_4, Nitrate(NO_3) first.

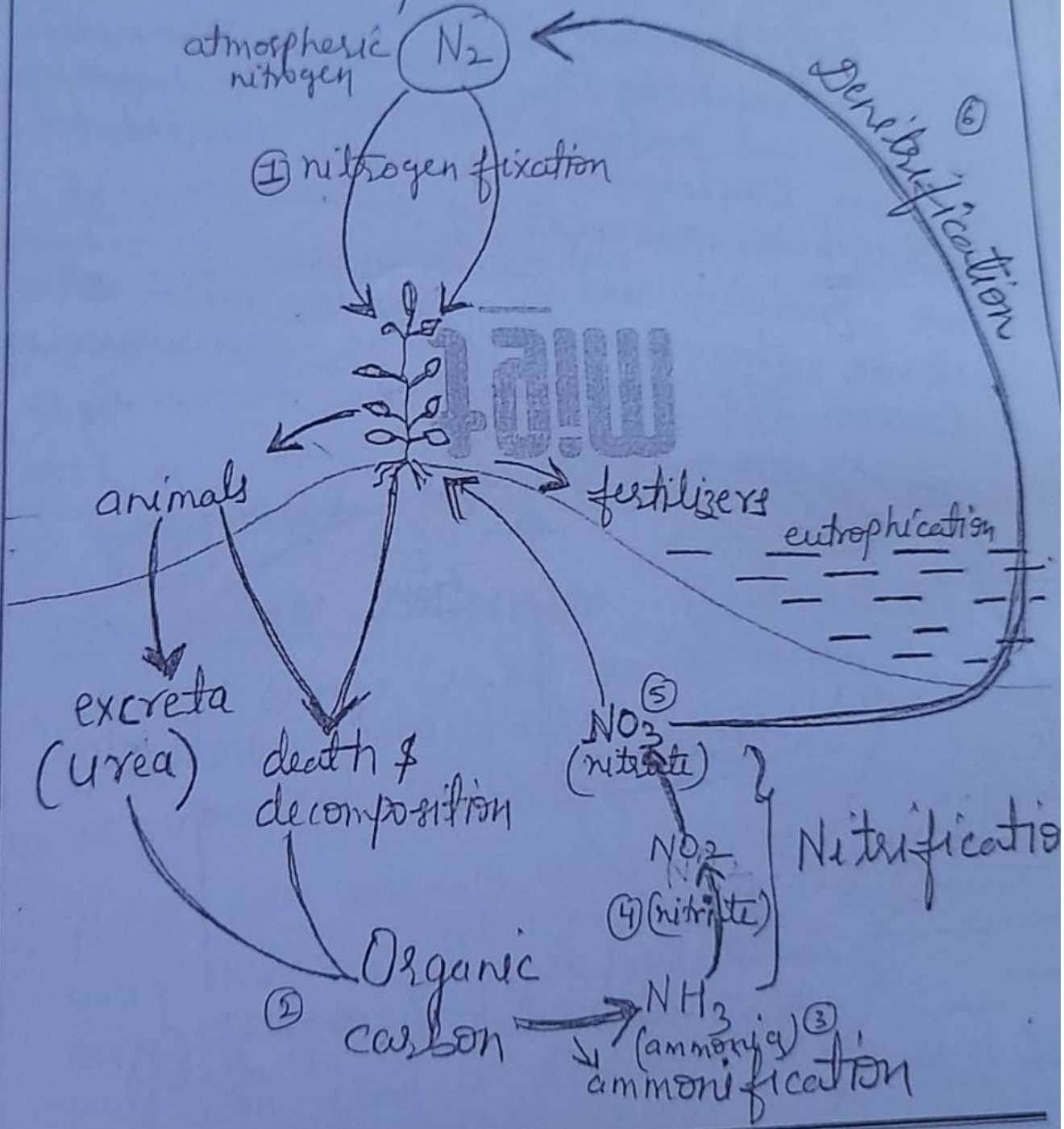
- Following are the important steps in N_2 cycle

i) Nitrogen fixation:- It is conversion of molecular N_2 into usuable form.

ii) Ammonification:- Conversion of atomic N_2 in ammonia.

iii) Nitrification:- Conversion of ammonia in nitrite and nitrates in the presence of many useful bacterias.

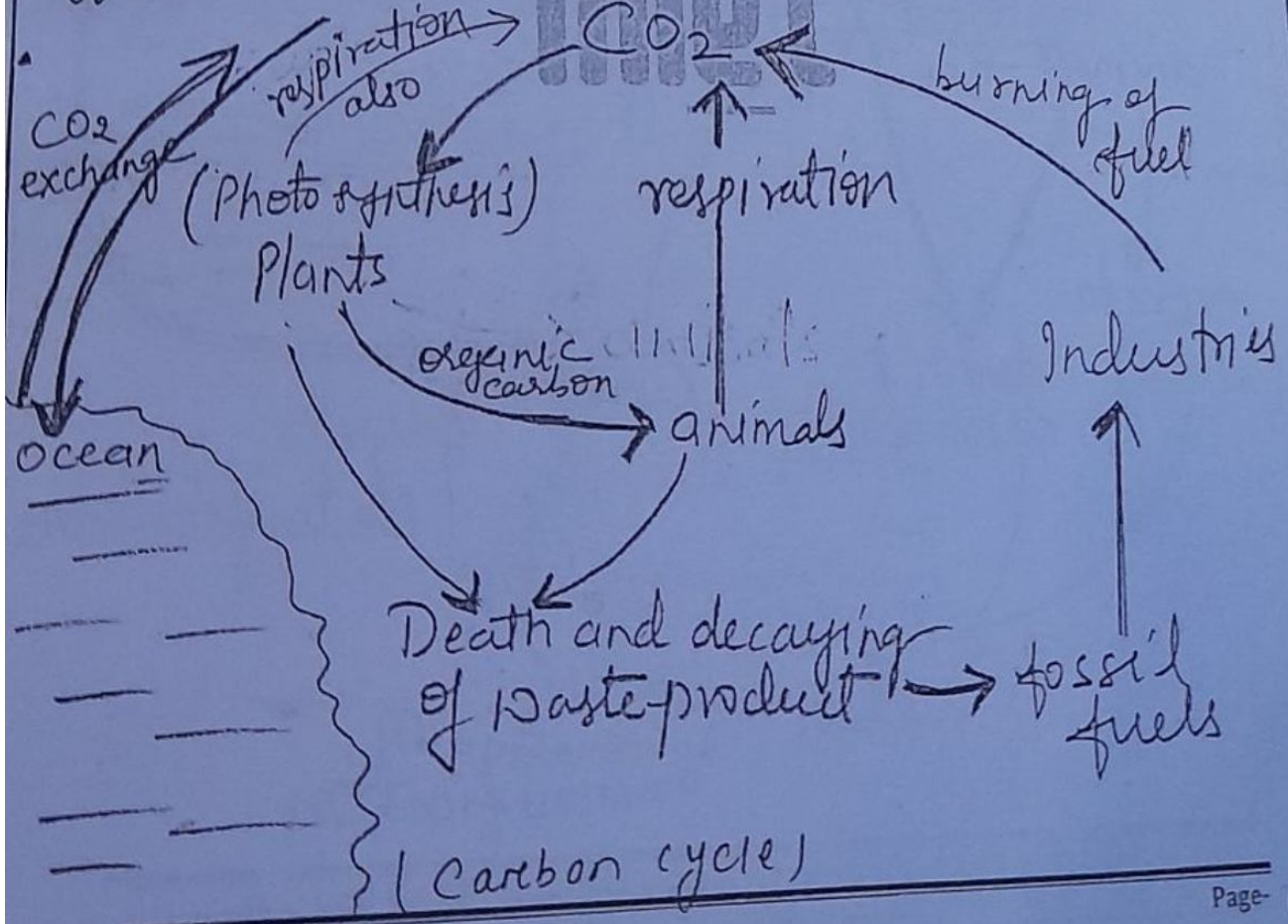
(iv) Denitrification :- Excess of nitrate on soil degraded into atmospheric N_2 by Pseudomonas bacteria and bring (N₂) back to atmosphere.



Nitrogen cycle

b) Carbon cycle:-

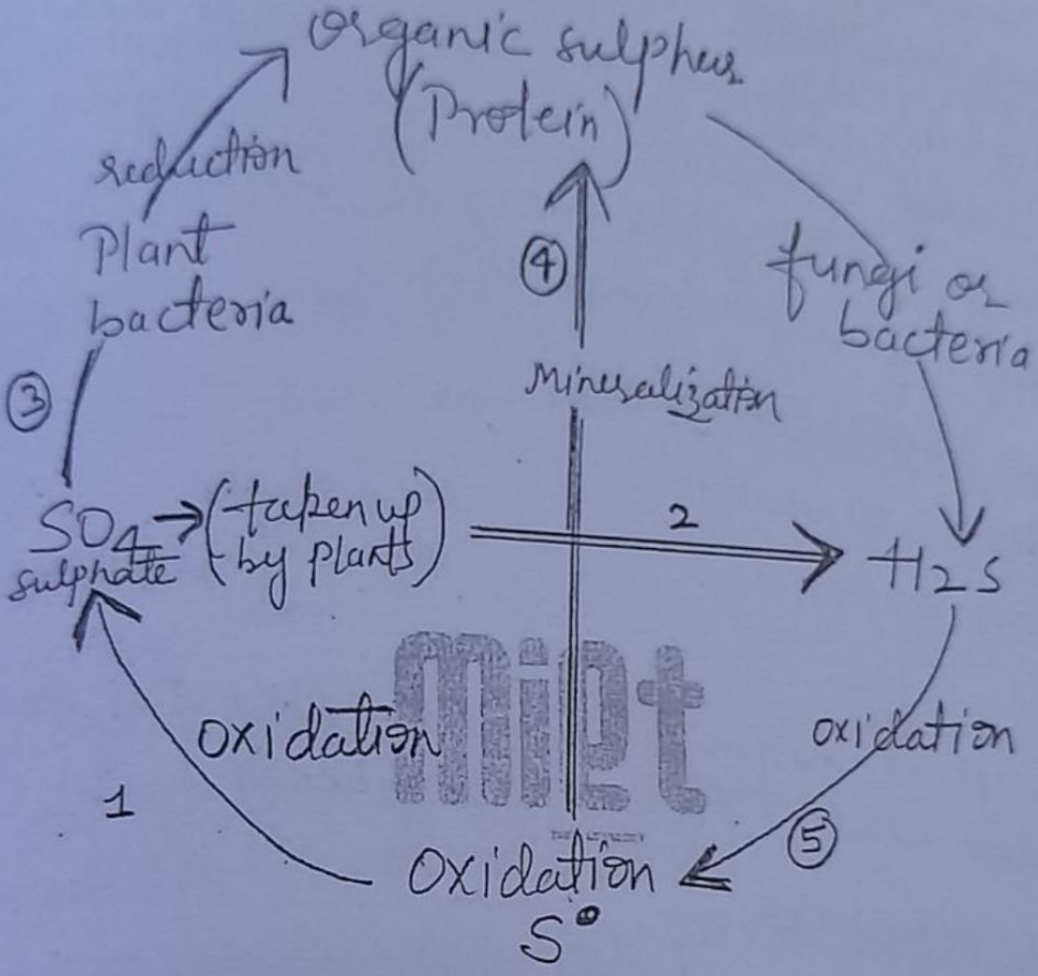
- Carbon cycle is very important biogeochemical cycle. Carbon is the basic element of all the living organisms
- It is very low that is about 0.03% in atmosphere It is absorbed by the Plants from atmosphere as CO_2 and prepare food through photosynthesis. to form Carbohydrates and fat. This fat and Carbohydrates absorbed by animals.
- From Producers and animals carbon is returned back to atmosphere. Sea is the major reservoir of Carbon. Sea regulate the CO_2 in atmosphere.



c) Sulphur cycle:-

- Sulphur cycle is also known as sedimentary cycle. Because major portion of this cycle occurs in soil, sediments.
- Sulphur and its components are required by plants and animals for synthesis of amino and proteins.
- Sulphur enters into the almosphere through Volcanoes, industries and from the oceans.
- In almosphere Sulphur oxidized into SO_2 SO_3 which reacts with water to produce H_2SO_4 (acid rain).
- Sulphur is soluble in water and absorbed by plant roots as SO_4 where it forms and amino acids. from where the protein the form of Sulphur moves to animals. From animals the Sulphur is excreted out and back to soil and the the bottom ponds, lakes and sea.

Sulphur cycle.



Most of the reactions take place in soil sediments so also called as Sedimentary cycle

P7 Explain a brief note on biomass energy:-

- Biomass energy is obtained from plants and animals since biomass. It is renewable energy.
- Biomass include wide variety of items such as animal manure, vegetable oil, algea, crops like corn, potato, rice straw, sugarcane, Jatropha (oil producing plant).
- Advantages

i) Renewable e.g. We can produce biogas from cattle dung continously as energy resource
ii) EcoFriendly – no pollution
iii) It reduces our dependency on fossil fuels.
iv) Less expensive than fossil fuels.
v) Less waste generation.

Disadvantages

i) Biomass energy is not as efficient as fossil fuels. Some biofuels like ethanol is in-efficient as compared to petrol.
ii) It is not entirely cleaned. the use of animal and plant waste increased the amount of methane gas into environment.
iii) It can lead to deforestation as wood is an important biomass energy.

Note:- We can explain Biogas with neat sketch here with

UNIT-3

Q) What do Mean by air pollution. ; Write its effects, causes and control measures.

- Air pollution refers to any physical, Chemical and biological Changes in the air. It is contamination of air by gases, dust, Smoke etc.

Causes of air pollution :—

- Pollutants are the substances which cause pollution. There are two sources of air pollution
  a) Natural sources :- Volcanoes, oceans, Forest fires, pollen grains.
  b) Man made sources :— Industries, automobiles, burning of fossil fuel, Mining industries etc

Effects of air pollution: on humans:

- Respiratory problems like Asthma, Bronchities,
- Eye irritation, throat infections.
- CO (carbon monoxide) when inhaled cause Suffocation and death.

Many peoples die every year due to direct and indirect effects of air pollution

Effects on Plants

- Chlorosis: Yellowing of plants due to reduc... chlorophyl.
- Early maturing and falling of leaves.
- Falls agricultural production.

Some other effects are

1) Global warming.
2) Ozone depletion.
3) Acid rain.
4) Damage to historical buildings like Taj Mah... London house, statue of Liberty.

Control Measures:—

i) Industries can treat/ clean their gases wa...
ii) Automobiles should check properly their e...
iii) Replacement of fossil fuels with renewal... sources of energy.
iv) Use of good quality of coal rather ch... one.
v) Environmental protection laws and ~~Vehicula~~ Vehicular emission Act must be follow... properly.

What do you mean by water pollution? write its effects, causes and control measures.

Water pollution refers to any physical, chemical and biological changes in the water. It is contamination of water with effluents, oils, detergents, pesticides and municipal waste water.

Causes of water pollution:—

- Industrial Effluents
- Sewage water
- Fertilizers
- Detergents
- Religious practices.
- Oil spillage in sea and Oceans.
- Deforestation.

Effects of water pollution:—

Polluted water can be a source of many water born diseases.

Pollution affects the quality of water.

It reduces the DO in water which can kill the water organisms.

Water pollution can be a source of degrading of our lakes and ponds through Eutrophication

v) Oil spills in sea can kill the sea organisms like Coral reefs.

vi) Polluted water emits offensive odour in atmosphere.

vii) Water pollution also reduces the Asthatic value of a place.

Control Measures:-

1. Industries must clean their polluted waste water through the process wast water treatments.
2. We can use organic farming where less fertilizers and pesticides can be used.
3. Thermal power plants must cool the heated hot water before discharging into lakes and ponds.
4. Bathing and washing near river must be prohibited.
5. Afforestation
6. We must dispose the solid waste like plastic polythenes properly.
7. Plantation near river banks are also very important.

3) What do you Mean by Noise pollution. write its effects, causes and control Measures?

- Noise is an unwanted sound, which has no value. but having health hazardous.
- The word 'Noise" was taken from a French ward "Nausea" which means discomfort.

Sources of Noise:-

1) Noise creating industries.
2) Vehicles.
3) Transportation (air, water, land)
4) Home appliances like TV, coolers, Mixer grinder etc.
5) Festivals and celebrations
6) Army exercises also create noise
7) Mining

All are noise making.

Effects of Noise pollution:

i) Hearing damage
ii) Improper communication
iii) Migrain and headach.

iv) Reduce heared output.
v) Hypertension
vi) Low working efficiency in noisy env
vii) Noise effects the quality of life.

Control Measures:—

i) Plantation is a very imporetant to co
noise pollution.
ii) The workers in industrial areas must
specific gadgets which can protect them
noise.
iii) Noise making Machines must oiled a
greezed..
iv) Through laws
v) TO creat awareness among people
effects of Noise pollution.

What do you mean by Soil Pollution ? Write its effects, causes and control measures.

Addition of toxic substances on to the soil which affects the quality and use of soil called as soil pollution.

Causes of Soil Pollution

- Industrial waste
- Thermal Power plants using coal to produce electricity but the end product fly ash cause soil pollution.
- Nuclear power plants - Radioactive waste
- Agricultural waste
- Solid waste like plastic, polythene, aluminium cans, Medical waste, electronic waste also cause soil pollution if not disposed properly.

Effects of Soil pollution.

- Affect human health
- Reduce soil productivity
- If soil gets polluted it pollutes ground water.

- Radio active waste on soil causing abnormalities in human and animals.
- Exposure to heavy metals like mercury, cadmium, lead cause nervous damage and reproductive failure (infertility)

Control of Soil pollution

- Industrial effluent must be properly treated before discharging on to soil.
- solid waste should be properly collected and disposed off by appropriate method.
- Biodegradable organic waste should be used for generation of electricity.
- cattle dung should be used for methane generation in biogas plant.
- There should be optimum use of fertilizers and pesticides.

(Q5) What do you understand by the term "Solid waste management"?

Ans Solid waste management refers to the complete process of collecting, treating and disposing of solid waste. This process include collection, transportation, treatment, analysis and disposal of solid waste.

Sources of Solid Waste :—

- Solid domestic garbage like paper, polythene, Plastic bottles, discarded clothes, diapers, alluminum cane etc.
- Solid waste from various industries
- Agricultural waste
- Electronic waste (E-waste) includes discarded electronic appliances, CDs, floppy, keyboards etc
- Medical waste which include gauge, cotton, syringes, needles and anatomical body parts.
- Horticultural wastes.
- Construction and demolition waste

Effects of Solid waste :—

- Solid waste has many effects on human health such as
  - Damage to nervous system, blood system.

b) Effects brain development of children
c) Respiratory and skin disorders due to bio
Magnification in fishes
d) The toxic solid waste such as heavy met
cause reproductive abnormalities.

e) Control For Solid Waste :—

i) Sanitary Land filling where solid waste i
disposed in a pit that is dug in the grou
and then covered with clay, sand, gravel
top soil.

ii) Incineration :— In this process a huge amou
of solid waste burned at very high tem
-ture in presence of oxygen with the con
way. It is basically designed bor industr
But it Produces lot of pollutants in a

iii) Composting :— composting where the organic
is decomposed by bacterias and a good qu
of manure is the final product.

iv) Pyrolysis :— In this process, solid wast
burned at high temperature in absence
oxygen

Solid waste Management :-

Solid waste has not only increase in the quantity but it has also increased as a quality as well we see different quality of solid waste in Market like varieties of disposables. To rectify it we need an approach of solid waste Management that include 4 Rs

Refuse
Reduce
Reuse
Recycle

} This approach will save our resources, energy, Human Resource, forest, land.

6) Explain in detail working of waste water treatment plant with a neat sketch.

- Water pollution can be minimized by waste water treatment process where the waste water goes through different steps before its final discharge into water bodies.
- There are three steps of waste water treatment process.

i) primary process :- Screening, Sedimentation.

ii) Secondary process :- Oxidation,

iii) Tertiary Treatment :- Chemical treatment of water

i) Primary Process:- (waste)

- Large particles in water are separated by bar screens. This is a simple method like filtration or sedimentation.
- Small particles like sand, silt get sedimentated in grit tank.

ii) Secondary Process:- (Using microbes to clean water)

In this process air is supplied to the water to promote the decomposition of organic matter by bacteria in the tank called Oxidation tank. This process results in production of sludge (mud) at bottom and CO_2 at Top

iii) Tertiary treatment:-

The waste water that is still having nutrients, organic matter, pathogens etc. all of these are removed by chemical Oxidation of water by chlorine, ozone gas, UV rays etc. After this the treated water can be discharged into natural water.

*note Neat sketch is important to draw here:-

Sewage Treatment Plant

7) Write Short notes on the following:-

a) Smog

b) Primary and Secondary pollutants.

a) Smog:-

- Smog is a Secondary pollutants which is formed by the combination of smoke present in atmosphere and Fog.

  Smog = Smoke + Fog.

- Smog has serious consequences on human health as we have seen in the past that of people killed in London smog in year 1952.
- It cause throat infections, choked the respiratory canal and also infect the lungs
- It can cause irritation in eye, skin and acidic nature.

b) primary pollutants and Secondary pollutants

- Primary pollutants are discharged by being directly into atmosphere. Examples are NO_2, Hydrocarbones, oxides of Sulphur, dust.

Secondary Pollutants :—

- These pollutants are not directly discharged by human being. They are formed when primary pollutants in atmosphere are combined with some other pollutants present in environment example are Smog, H_2SO_4, HNO_3 etc.

Unit IV

Q1. What do you mean by Green house effect? Also explain the phenomenon of global warming its effects and suggest some remedial measures to control it.

Ans. Green House effect is the warming of earth's surface and its lower atmosphere due to Green house gases (CO_2, CH_4, N_2O, O_3, CFCs). These gases allow infra red rays of sun which are having heating effect, but do not allow them to go back. So trapping of them in this way cause increased heating of earth which is called green house effect or global warming.

Causes of global warming

- Continuous emmission of gases in atmosphere
- burning of fossil fuel.
- Deforestation increased the level of CO_2 in atmosphere.
- Unsustainable agriculture.
- Using CFCs in ACs and refrigirators
- Improper disposal of solid waste.

Effects of Global warming.

- Global warming would cause melting of glaciers.
- Rise in sea level
- Changes in the pattern of rainfall
- Floods, droughts.
- loss of biodiversity
- Outbreak of diseases like malaria, dengue.
- Effect on human health
- Effect on Agriculture
- Submergence of low lying areas in sea.
- livelihood of millions of people will be affected.

Control Measures.

- Afforestation since more trees more will be absorption of CO_2.
- Shifting towards green energy such as Solar energy, water energy, windener
- Sustainable agriculture
- Alternatives of CFCs.
- Trapping of CH_4 from landfills.

Q2. What is ozone hole? What are the causes of Ozone hole formation? Write the effects of depletion of Ozone layer on environment.

Ans. Ozone in present in atmosphere (Stratosphere) about 30-40 kms above the earth surface. This layer of O_3 (ozone) protect the earth from harmful effects of U.V rays.

Formation of O_3 in atmosphere

$$O_2 + h\nu \longrightarrow O + O$$

$$O_2 + O + M \text{ (third body)} \longrightarrow O_3 + M$$

$$O_3 + h\nu \longrightarrow O_2 + O$$

Ozone depletion

The O_3 layer can be depleted by free radicals including NO, OH, Cl, Br. The concentration of these radicals have increased in atmosphere in recent years. Chlorofluoro carbons (CFCs) are very stable and able to break O_3 molecules in stratosphere.

$CFCl_3 + h\nu \rightarrow CFCl_2 + Cl^{\cdot}$

$Cl + O_3 \rightarrow ClO^{\cdot} + O_2$

$ClO + O \rightarrow Cl + O_2$

Effects of UV radiations

- Skin cancers
- Sun burn
- Cataract (मोतियाबिंद)
- Impaired immune system
- Damage to plants cells as well
- Melanoma (skin cancer) most fatal.

Solutions to Ozone layer Depletion

- Avoid using Ozone depleting substances
- Minimise the use of vehicles.
- Using ecofriendly cleaning products.
- Use of N_2O should be prohibited
- Replacement of CFCs with HCFCs.
- Montreal Protocol is a global agreement proposed in 1987 to focus on the protection of Ozone layer.

Q3 What do you mean by Acid Rain? Write its effects and control.

Ans. Acid rain is one of the most dangerous pollution. It is the mixtures of acids in rainwater. Acid rain is the man made phenomenon.

Causes of Acid Rain

→ Industrial discharge of gaseous in atmosphere
→ Burning of fossil fuels
→ Volcanoes
→ forest fires
→ Biological decaying of algae in Oceans.

Formation of Acid Rain

$$2SO_2 + O_2 \rightarrow 2SO_3$$
$$SO_3 + H_2O \rightarrow H_2SO_4 \text{ (sulphuric acid)}$$

$$2NO + O_2 \rightarrow 2NO_2$$
$$NO_2 + H_2O \rightarrow HNO_3 \text{ (nitric acid)}$$

The PH of natural rain water is near about 7 but becomes acidic due to H_2SO_4 and HNO_3 and becomes less than 4

Effect of Acid Rain

- On human it cause respiratory problems. It can cause asthma, dry cough, headaches and throat irritations.
  When absorbed by humans and animals cause kidney damage and Alzheimer's disease.
- Cause deforestation
- Reduce Agriculture production
- Crops like broccli, spinach, pea severely affected
- Reduce soil fertility.

Acid rain can damage buildings, railroad lines, airplanes, car, steel bridges, underground pipes this cause lot of damage to property.

Control measures of Acid Rain

- Industrial gaseous treatment
- Go towards alternation (renewable) energy resources.
- Sustainable agriculture
- Go use less volatile coal instead volatile one.

Q5. What are the consequences of Population explosion?

Ans. Population refers to number of people living in an area, be it a town, city, country or World.

Population explosion: Rapid increase in the population in an area. It is caused due to drop in death rate due to improved living conditions, improved medical facilities

Consequences of Population explosion

1. It can lead to competition for essential requirements like food, shelter clothing
2. It can lead to the depletion of natural resources.
3. It can increase the pollution of environment due to increased automobile usage
4. It can results unemployment and unhygienic living conditions.
5. Deforestation
6. Low income, illiteracy
7. Energy and water shortage

Characteristics of population

1) Birth rate (Natality) = Number of births/1000 individuals.
2) Death rate (Mortality) = Number of deaths/1000 individuals
3) Age distribution = % of individuals of different ages in a population.
The age distribution patter is commonly represented through age pyramids.
4) TFR = Total fertility rate — It is average number of children ~~that~~ would be born to a woman over her lifetime.
5) Migration ⇒ Moving into and out of a population is called migration in search of food, Job, medical facility etc.
6) Carrying capacity: The population size is limited by environmental factors like food, shelter, water. If these not available as per need; population decreases. This is called carrying capacity of environment.

(Q6) Burning of paddy straw is a serious issue. Justify the statement.

Ans. Burning of paddy straw is a term that is frequently seen in the news nowadays. It is one of the major causes of winter pollution in North India, particularly in Delhi and adjoining areas. It is also called as stubble burning.

Stubble burning is the intentional burning or setting on fire of crop residue to remove them from the field in order to sow the next crop.

In Punjab and Haryan, farmers burn the stubble (rice chaff) left after the rice harvest so that field may be readied for next Rabi (winter) crop like wheat.

Section 188 of the Indian Penal code (IPC) makes stubble burning a crime. Despite being banned, this practice continue in India.

Effects of Stubble burning

1. Pollution - Its burning released about 149 million tonnes of CO_2, 0.25 million tones of SO_2

1.28 million tonnes of particulate matter. and thus contribute to green house effect.
- It is responsible for the formation of smog in winters. This smog is acidic in nature and also reduce the visibility of environment in winters
- Many micro-organisms killed during burning. The loss of these micro organisms leads to an increase in pest population that will cause diseases in crops
- Lot of Nitrogen, potassium, sulphur, phosphorus as well as organic carbon destroyed every year on account of stubble burning.

Solutions to stubble burning problem

- Encourage farmers to go for early paddy (rice), so as they give them enough time to harvest and prepare for next Rabi crops.
Encourage farmers to grow alternative crops and shift them towards maize, fruits, vegetable, cotton
Use machinery like happy seeder to remove stubble.
Penalise farmers if involved in stubble burning.

Unit V

Q1 Discuss in brief the salient feature of the 'Environment Protection Act 1986'

Ans The environment Protection Act was enacted in the year 1986. It was enacted with the main objective to provide protection to the environment and for matters connected with it.

Aims and objectives of EPA (An Umbrella Act)

1. Implementing the decisions made at the United Nations conference on Human Environment held in stockholm.
2. Creation of Authority to regulate Industries that can issue direct closure orders
3. To set up standards for the quality of air, water and soil.
4. To set up maximum permissible limits for pollutants in environment
5. To execute nationwide programmes and plan to further environmental protection.
6. This law can impose restriction on the location of Industries

7. This law gives the government the power of entry for examination, testing of equipment of and other purpose and power to analyse the sample of air, water, soil or any other substance from any place.

8. To set up standards for handling of hazardous substances.

9. The Act empowers any person, apart from authorised government officers, to fire a complaint in a court regarding any action that is against law.

Environment Protection Act 1986 is also the Umbrella Act because it provides the framework to central government in order to make the coordination between different state as well as the central authority in order to improve the quality of air, water and soil and can use different Acts like Water Act, The Air act.

Issues involved in EPA 1986

- Since the Chairman and members of the Board are either from the Forest services or

administrative services, they don't have technical background in pollution control and they find difficulty in providing proper guidance to their subordinates.

- Due to insufficient funds the pollution control Board are not able to persue the legal actions.
- The offenders of Wildlife (Protection) Act are not subjected to harsh punishment Fine is not enough to deal with the hunters.
- Jammu and Kashmir has its own wildlife Act which does not follow the central Wildlife Act which results in hunting several endangered species.

(Q2.) Who do the term NGO refers to? Write about the functions of NGO's.

Ans. NGOs refers to Non Government Organization engaged in working towards the improvement of social, economic, environmental and political condition of the country. They include many groups and institutions

that are entirely or largely independent of government.

Functions/Role of NGOs

1. Creating Environmental Awareness
2. Creating awareness for Afforestation, Agro forestry, social forestry.
3. Create awareness for using renewable energy resources.
4. Work for Zero waste production
5. Mobilizing public support for conservation of endangered species.
6. To create awareness among farmers about Sustainable/Organic farming
7. Work for Disaster management.
8. Work against illegal mining and illegal cutting of trees in Hilly areas.
9. Organising seminars, lectures and group discussion for promotion of environment awarene
10. Helping villages administrative official projects on environmental protection.

India has a number of NGOs that work in the field of environmental conservation

1. Assam Science Society - Established in Gauhati Assam in 1953.
2. The Bombay Natural History Society (BNHS) One of the largest NGO established in 1883. It sponsors studies in Indian Wildlife and conservation
3. Centre for environmental Education (CEE) Aims to create environmental awareness in society, conduct widespread Environmental education and training programme.
4. Centre for Science and Environment (CSE)
5. Kalpavriksha - began in 1979 with a camping led by students to save Delhi Aims to conduct research in Environmental problems.
6. Narmada Bachao Andolan - set up in 1986 in Madhya Pradesh.
7. World wide Fund for Nature-India (WWF-I) - Deals with the protection and conservation of Environment in In

(3). Write a detailed essay on woman education and its need? Discuss the strategy government of India taken in this field.

Ans. Woman constitute almost half of the population in the world. But they were denied equal opportunities in different part of the world.

Access to education has been one of the most pressing demand of woman's right movement.

Educate a man you educate one person. Educate a woman and you educate the whol family: Jawaharlal Nehru.

Woman education in India has been one of the major issues of concern of government of India as well as society. It is because today educated woman play a very important role in overall development and progress of the country. Woman hold a prominent position in the world and society.

Obstacles / barriers

- Gender discrimination still persists in India male literacy rate is 84% while female literacy rate is just 71.5%.

- Low enrollment of girl child in school.
- Engagement of girls in domestic work.

Government Measures undertaken in women education

- Beti Bachao, Beti Padhao:- Aims to generate awareness for the protection of girl child.
- Sarva Shiksha Abhiyan:- It has target to open new schools, oppointment of women teachers, separate toilets for girls etc.
- Udaan :- CBSE has launched 'Udaan' to provide free online resources to girls of class XI and class XII for preparation.
- National scheme of Incentives to Girls for Secondary education
- Mukhyamantri Kanya suraksha Yojna
- Sukanya Samiriddhi Yojna – It is a savin schemes designed for girl children. Encoura parents to save towards education of the girl child.