जय सरस्वती माता

Imp:
Q/: Why E.V.S. is multidisciplinary nature?
① Acid rain, Global warming.

M.Imp
Q/:- What is the importance of learning E.V.S.?

Ans:- Importance of Environmental Sciences

① In solving complex global Environment issues. Global warming, Acid rain, depletion of ozone layer.
② In controlling all types of pollution.
③ Industrial development in an Ecofriendly manner.
④ In conservation of natural resources.
⑤ In promoting sustainable development.
⑥ To understand Environmental laws & policies.
⑦ In conservation of depletion of biodiversity.
⑧ In Solid waste management.

Q/:- Importance of E.V.S. as a carrier opportunity.
Ans:- ① In Industries:- Environment expert are hired by various Industries for eco-friendly development.
② In R&D Sector:- R&D opportunity is in the area relating to control of pollution.
③ As a Consultant (Consultancy):- Environmental Consultants are hired by government for Solving Complex Environmental issues.
④ Academics:- Environmental teachers are needed at every level in schools and Universities.

(5) Green Marketing :- Skilled man power is very much in demand for promoting eco-friendly products in the market.

(6) Green Advocacy :- Environmental lawyer's are needed from implementing environmental laws in the court.

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Q/:- What is Ecology ?

Ans:- The study of relationship b/w living and non-living organisms with each other and with their environment is called Ecology.

(OR)

The study of any Ecosystem is called Ecology.

Ecosystem :- An Area or a Community where both living and non-living organism live together and there is a exchange of food material and energy b/w them.

The term Ecology was first pointed by Earnest Hackel.

Types of Ecology :-

(1) Autecology :- Study of an individual organism in an ecosystem.

(2) Syn ecology :- Study of group of organism in an ecosystem.

The term Ecosystem first named by Arthur Tansley.

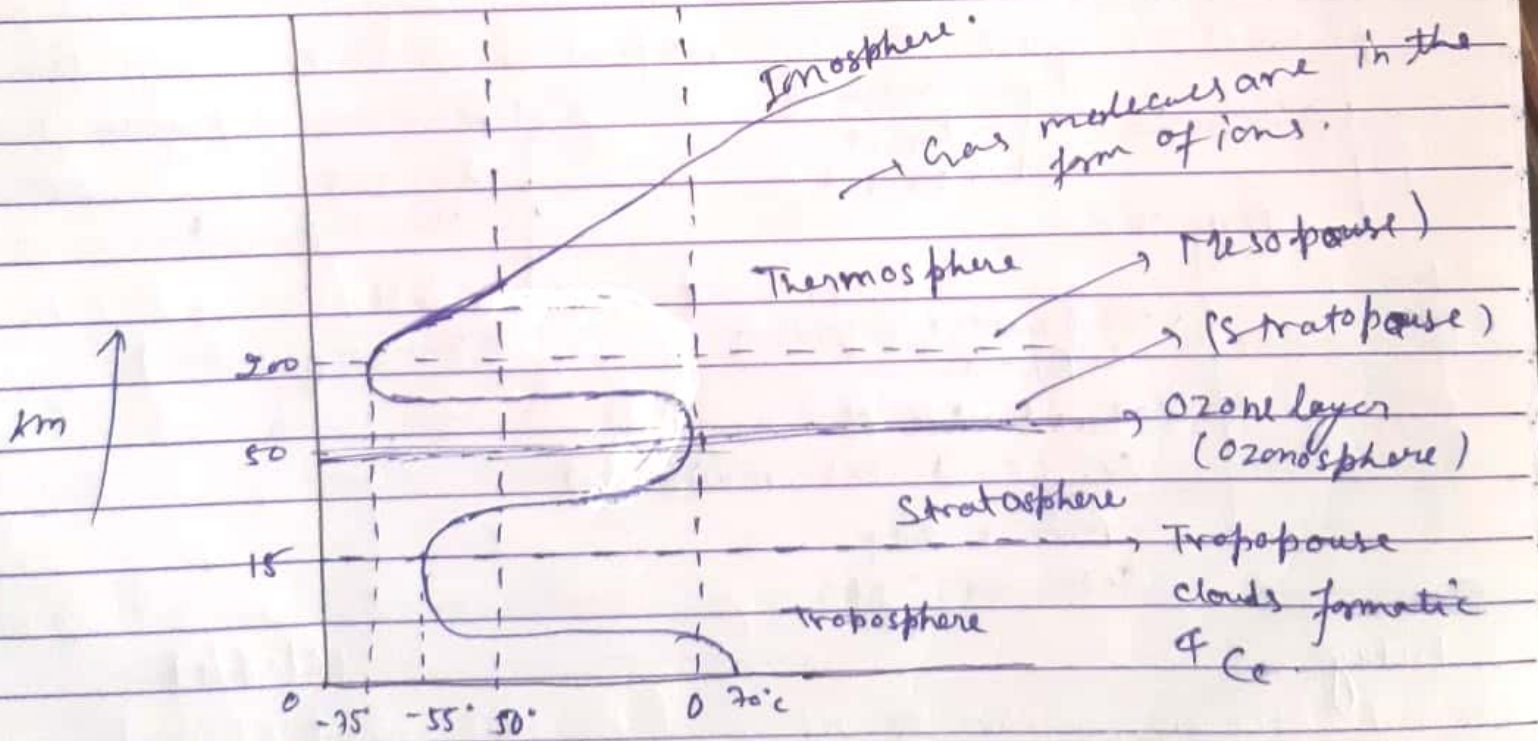
Natural Environment (Biophysical Environment)

① Atmosphere

② Lithosphere
Solid part of earth.
Importance
① It provides shelter or habitat to all animal and plant.
② It provides food material in the form of agriculture.

③ Hydrosphere
The ocean covered by water.
Importance:
① It provides shelter to aquatic animal.
② It provides food material.

Most Imp. Vertical Classification of Atmosphere :-



Function Activities :-

① Troposphere :- Clouds formation & formation of Convectional currents.
② Stratosphere :- Formation of Ozone layer Acid rain.
③ Mesosphere :- Burning of Meteraites & Comets.
④ Thermosphere :- Gas molecules are in the form of ions.
⑤ Ionosphere :- Deductions of Signals by Radius.

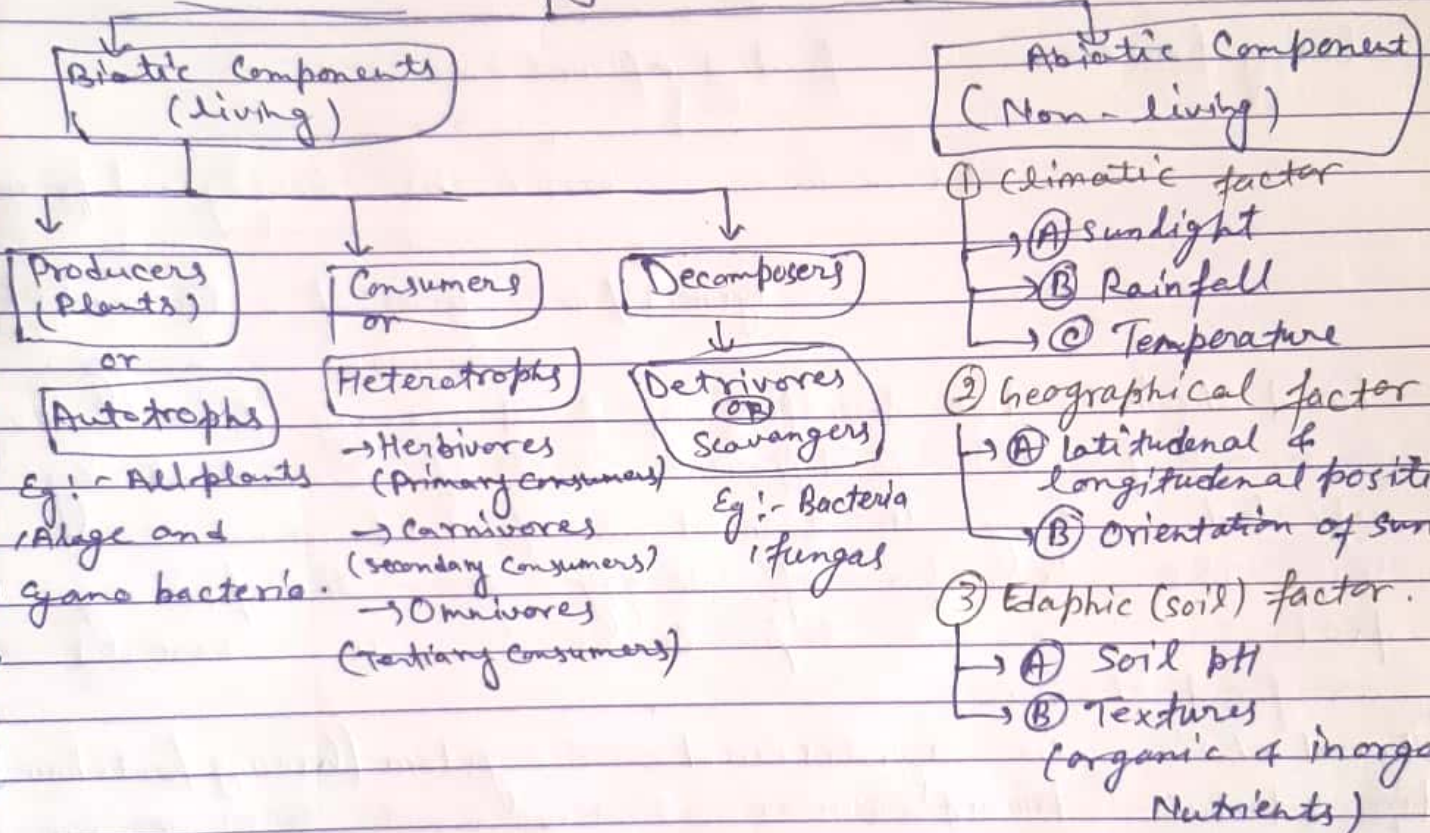
Note :- Why astronauts do not feels heat in the thermospheric region.
Because gas molecules are present in the form of ions.

Classification of Ecosystem :-

- Natural Ecosystem
  - Terrestrial
    - Grassland
    - Forest
    - Desert
  - Aquatic
    - Fresh water ecosystem Ex: Rivers.
    - Eusturine eco. Ex. (Eusteries, mouth area)
    - Marine Sea Ex :- sea, Ocean.
- Artificial or Man made Ecosystem (Microcosm Ecosystem)
  - lantic (Standing water)
  - lotic (Running water)

Eustaries :- Eusteries is the junction pt. where the fresh water from the river meets with the salty water of Ocean.

① Structure of an Ecosystem



There are some other component which can also describe the structure of Ecosystem.

② Species Composition :- means the no. of species present in an ecosystem.

③ Startification :- Presence of one or more layer in the vertical structure of an ecosystem is called Startification.

④ Trophic Structure :- The producer consumer feeding relationship can also be represented through Trophic Structure.

Functions of Ecosystem :-

- Energy function
- feeding function
  - Food chain
  - Food web
  - Ecological pyramids
    - Pyramid of no.
    - Pyramid of Biomass
    - Pyramid of Energy.

Food chain :- The transfer of food energy from the source (plants) to different levels of consumers by repeated eating is termed as food chain.
Thus the transfer of energy from the primary producers to the top consumers is termed as food chain.

① Food chain in a grassland Ecosystem (Grazing food chain)

primary producer → primary Consumer → Secondary consumer → Tertiary Consumer

Grass → Grasshopper → Mouse → Snake

Snake → Top Consumer

Grass, Grasshopper, Mouse, Snake → Decomposers

Eagle or Hawk → Decomposers

② Food chain in aquatic ecosystem (Aquatic food chain)

Pr. producer → Pr. Consumer → Sec. Consumer

Phytoplankton → Zoo-plankton → small fishes

Phytoplankton, Zoo-plankton → Decomposers

small fishes → Big Bony fishes (Tert. Consumer)

Big Bony fishes → Shark whales (Top Consumer)

Shark whales → Decomposers

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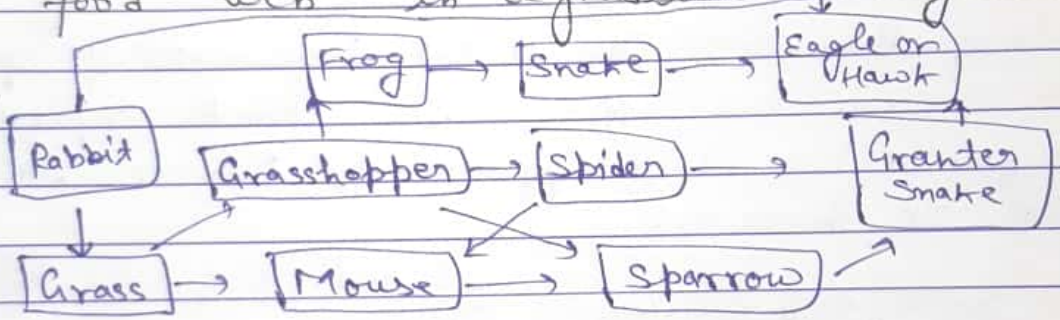
Food Web:- In a particular ecosystem an individual food chain never exist. Because a particular organism feeds upon multiple types of species. In this way there are large no. of food chains exist in a particular ecosystem. these food chains are interconnected together through different types of organism. This inter-connection of different food chain is called a food web.

A food web in a grassland Ecosystem :-

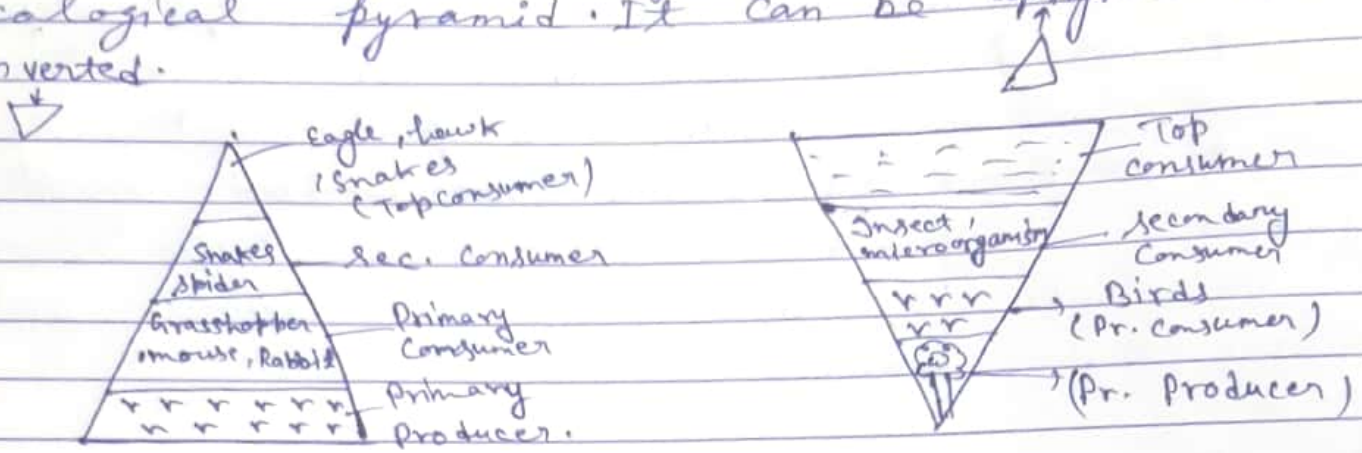


Imp Ecological Pyramids :- The graphical representation of different ecological parameters like no. of species, Biomass of species and their energy level can be represented in the form of a pyramid called as ecological pyramid.

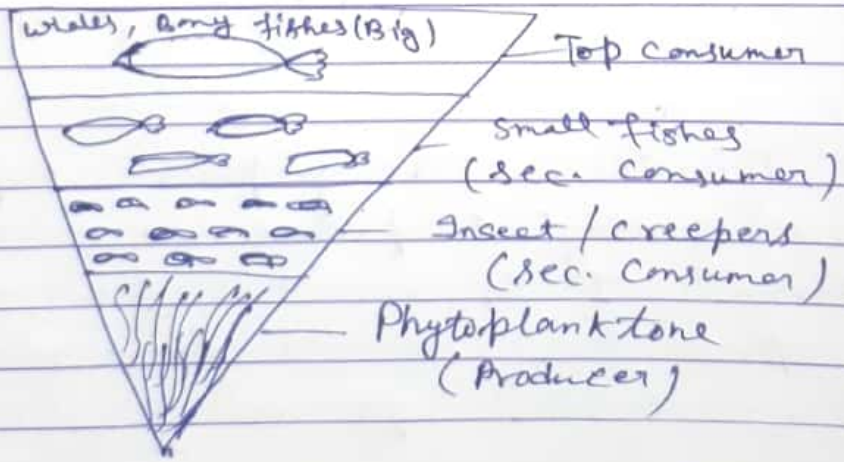
There are three types of ecological pyramids.

(i) Pyramid of no.
(ii) Pyramid of Biomass.
(iii) Pyramid of Energy.

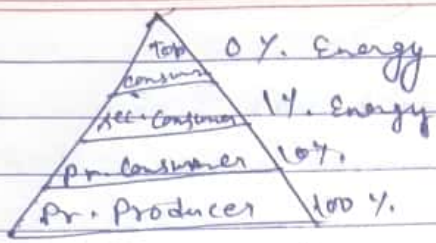
Pyramid of no. :- The no. of species present at each level in an Ecosystem is called the Ecological pyramid. It can be upright or inverted.



(2) Pyramid of Biomass :- The total dryweight of species in a eco-system and different level can be represented by a pyramid is called pyramid of Biomass it can be upright or inverted



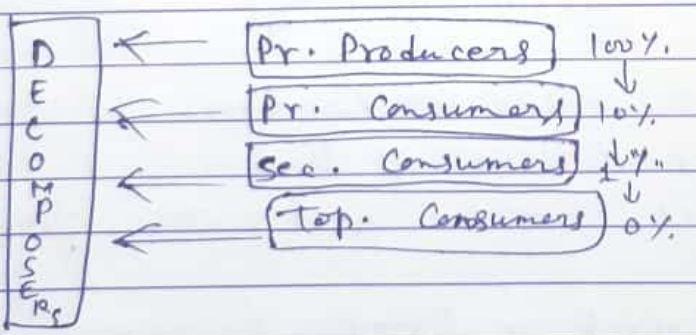
(3) Pyramid of Energy :- The graphical representation of amount of energy trapped by organisms at different level of Eco-system is called Pyramid of energy. The pyramid of Energy is always upright. because the producer are always represented by base. and the consumer always represented the upper.



Upright pyramid of Energy.

Energy flow in an Ecosyetem

- Energy flow in an Ecosystem follows the 10% Energy rule i.e., energy is being transferred from primary Producers to top Consumers in only 10% part.



Imp: Natural Resources

All those resources which are obtained from nature and useful for human are called natural resource.

Q:- What are the kinds of Natural Resources?

1- Inexhaustible or perpetual N Resources
2- Renewable N Resources.
3- Non-Renewable (Exhaustible)
Imp 4- Intangible N-Resources.
100%

① These natural resources which can never be finished and are everlasting.
Eg: Solar Energy, wind energy.

② These N.R which can again be regenerated after a fixed interval of time.
Eg:- forest, wood, fresh water, food.

③ These N.R. which are fixed in amount and cannot be regenerated after human consumption.
Eg:- All fossil fuels → coal, petrol, minerals (Uranium).

Imp ④ Those N.R. which are non-physical and non-materialistic in nature which can only be felt by living beings.

① Fresh water N.R.
② Forest N.R.
③ Mineral N.R.

① Fresh water N.R. :-

Distribution of fresh water globally :-
70% of the total land area is covered with water.
97% of water is in the form of ocean & seas.
2% of water is in the form of polar ice glaciers.
1% is available as fresh water.

Quality Parameters of a drinkable water :-

Chemical parameter
① P_H of water
② Turbidity.
③ Dissolved Oxygen (D.O)
④ Biological Oxygen Demand (B.O.D)
⑤ Coliform Bacterial count (Biological Parameter).

① It is a measure of acidity / alkanity of any solution. (6.5 - 8)
② The soapy content in the form of ppt. present in water. (not ~~more than~~ less than 6mg/L)
③ The amount of oxygen in mg present in 1 litre of any drinkable water is called dissolved Oxygen. (~~more than 20~~) (~~not less than~~ more than 6mg/L)
④ The amount of dissolved oxygen decreases with increase in pollution.
④ The amount of oxygen in mg needed by a bacteria to oxidize the organic waste material present in 1 litre of water is called Biological Oxygen Demand (B.O.D.) (~~not more than 2~~) (less than 2)

The value of B.O.D. increases with increase in pollution.

(5) The total no. of disease causing bacteria (E. coli) present in 100ml of a water sample is called Coliform bacterial count. (less than 50/100ml).

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Ecological Succession :- It can be defined as an orderly process of changes in the structure of an ecosystem that takes place with the passes of time through modification in the Environmental conditions is called Ecological succession.

Ex :- Ecological succession of fresh ecosystem.

Rocks → Moss → Ferns → small Grasses → herbs
Forest Ecosystem ← Giant trees ← Bushes ← shrubs ←

Xerosere or xerarch → Ecological succession of Desert Ecosystem

Hydrosere or Hydrarch → Aquatic Ecosystems Ecological Succession.

Bacterial borne water diseases :-

(i) Typhoid - Salmonella Typhoid
(ii) Cholera → Vibrio chloral
(iii) Tuberculosis → Mycobacterium Tuberculosis.

Viral borne diseases by water.

Hepatitis A → Hepadnavirus virus
Meningitis → cox-sac virus
Polio → Polio virus.

Most Imp:

Fluoride problem in drinking water / Fluoride Content.

Fluoride is one of the most essential element required for the proper functioning of human body. 1 ppm of fluoride level in body is the acceptable limit and 1.5 ppm is the tolerable limit. If water containing more than 1.5 ppm of Fluoride then it is reported to cause a disease named Dental fluorosis & skeletal fluorosis. In dental fluorosis decolouration of teeth from white to yellow and finally black. In skeletal fluorosis the bones and ligaments gets affected and the movement of shoulders and hips gets restricted.

Prevention

In case of higher fluoride concentration in water defluoridation of water is done using following methods.

(i) Fluoride exchange method
(ii) Anion exchange method
(iii) Use of calcium phosphate with supplements of Vitamin 'C'.

Imp:- In India the process of defluoridation is done by a technique name Nalgonda Technique developed by NEERI (National Environmental Engineering Research Institute Nagpur).

unequal water distribution is associated with economic conditions. Poor countries have less availability of fresh water than richer countries.

(4) Due to rapid rise in population, consumption of fresh water is more.

(5) Industrialization :- Industrial disposal directly into rivers, ponds, etc.

(6) Urbanization :- Rapid Urbanization & modern culture causes scarcity of fresh water.

30/08/19 Friday

Forest Natural Resources
19.8 % of the total land area is covered with forest.
11.7 % Dense forest
7.8 % Open
0.15 % Mangroove forest.

Classification of different types of forest :-
There are 16 different types of forest present in India which are broadly classified into 6 Categories:-

① Moist Tropical forest.
② Dry Tropical forest.
③ Montane Sub-tropical forest.
④ Montane Temperate forest.
⑤ Sub-Alpine forest.
⑥ Sub-Alpine Scrubs.

Imp: Importance of Forests

(A) Economic Importance :-
① Source of fuel wood :- Forest provides us wood which is the major source for cooking and heating as a fuel.
② Timber :- Forest provides timber which is use for making furnitures, houses, sports items etc.
③ Non-Timber products :- Forest provides us paper, Rubber, fibres, fruits, Nuts, Medicines, Resis etc.

(B) Ecological Importance :-

(1) Forests provides O_2 & consume CO_2, thus helps in solving the problem of global warming.

(2) Forests regulates climatic change, prevent landslides, soil erosion and flood.

(3) Forest helps in maintaining the Biodiversity. By providing Habitat for wild Animals.

(4) Forests controls air pollution by reducing suspended particulate matter (SPM).

(C) Aesthetic.

(1) Forest is being regarded as the symbol of god and goddesses for different religion and is of Aesthetic importance for them.

Most Imp. Deforestation :- Cutting down or felling of trees.

Causes of deforestation :-

(1) For expansion of cities and villages.

(2) For construction of big development projects, infrastructures, dams, Hydro electric plants etc.

(3) For acquiring land suitable for agriculture.

(4) For using as raw material by Industries like furniture Industries, Paper industry, medicines, resins etc.

(5) Due to mining for Industrial and Irrigational projects.

Measures (Methods) for Conservation of forest Resources :-

For conservation of forests following measures have been suggested :-

① Forest Plantation programs :- (Afforestation) :-
Plantation program is being encourage by government at all the levels of society.

② Joint Forest Management (JFM) :-
It is a program initiated by government involving public involment for planting of trees at the community level Nation.

③ Forest policy of Government :- Under this policy it is aimed of acheiving 33% of the total land area as forest against 20% which is presently.

④ Role of NGO's :- NGO's can work for the conservation of forests by spreading awareness regarding its importance.

⑤ By reducing the consumption of forest related products of those companies involved in deforestation.

2/09/19 Monday

Mineral Resources

What is the importance of minerals
① For proper growth & functioning of body.
② For Economic development of a country.
③ Mining is the process for Extracting minerals from earth.

Biodistribution of mineral Resources in India

① High availability (export)
Bauxite, Iron, manganese, chromite, mica, Abestos, titanium.

② Medium availability :-
Coal, Gold, Gypsum, limestone, Fluoride, Feldspar.

③ Low Availability :-
Copper, lead, Mercury, zinc, Tin, sulphur, Phosphorus, Platinum, Graphite, Potassium.

Use of Mineral Resource

① For development of Industrial plants and Machineries.
② Minerals are required for the generation of Energy.
③ In defence for making equipments weapons, Artilarries, Missiles etc.
④ Minerals are used as Construction material.
Eg :- Gypsum in cement, Limestone, Iron etc.
⑤ In Communication System for making electrical wires and cables.
⑥ In the formation of alloys.
⑦ In agriculture for making agricultural equipment, Fertilizers.

Imp. Consequences of excess use / over Exploitation of mineral Resources.

① Due to over excess use of mineral resources mining will be frequently done and this will have some bad impact on environment and

our health.

(ii) Air pollution : The dust particles in air due to mining is responsible for a desease silicosis and inhaelation of toxic gases.

(iii) Water - pollution :- Mining results leaching of toxic mineral inside the earth and may pollute ground water.

(iii) Mining results loss of land Morphology, soil hydrology and air and water pollution of that area.

(iv) Deforestation :- Mining results deforestation due to which there is loss of biodiversity.

(vi) Accidental discharge of toxic mineral during earthquake or landslide, causing damage to the whole ecological system.

Methods for Conservation of Mineral Resource.

(i) Careful or judicious use of mineral Resources.

(ii) Recycling and Reuse of waste mineral Resource into new one (3R - principle).

(iii) Developing more Efficient technology which requires less wastage of mineral resource.

(iv) Designing smaller equipments and machines with high efficiency.

(v) Developing substitute to rare metals replacing them with the one higher in quantity

(vi) Exploring out untrapped minerals (by deep sea mining) to lessen the pressure on those mineral resource are in less Amount.