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* Ecosystem & Ecology *

* Assignment :- 2

Q1. What are the objectives of ecology.

→ To describe the flow of energy.

→ To study temporal changes in environment.

→ To study the ecological levels of ecosystem.

→ To understand the effects of destruction of habitat, pollution, urbanization and the natural disaster have on population.

Q-2. Define (a) Ecology
(B) Ecosystem
(c) Thophic level
(d) carnivors
(e) Ecological pyramid
(f) decomposers.

ANS:-

(A) **Ecology :-** The study of organisms and how they interact with the environment around them or in other words it is the study

of habitat and interrelationship of habitat and living organism.

(B) Ecosystem :- "The Ecosystem is define as a structural and function unit of the biosphere, in which biotic and abiotic factors interect among themselves and with each other through the food chain, food web or chemical cycles, etc."

(C) Trophic level :- The various steps in a food chain or ecological pyramid, at which the transfer of food takes place from one organism to another organism is known as trophic levels.

(D) carnivores :- carnivores are animals that prey on other animals in order to survive.

(E) Ecological pyramid :- Graphical representation of trophic structure and function of ecosystem, starting with producer at the base and successive trophic level forming an apex is known as Ecological pyramid.

(F) Decomposers :- which substances are used heused by the producers resulting in a cycle exchange of materials between biotic community and abo abiotic environment of the ecosystm whom are called decomposers.

3. White a short of on marine ecosystem.

⇒ Marine ecosystem includes ocean, estuaries and coral reef ecosystem.

* Ocean ecosystem :-

⇒ It covers around 70-75 % of the earth surface .. it represents largest and most diverse ecosystem of all.

⇒ It plays role in survival of 2,50,000 marine species, serving as a food for humans and other organism.

⇒. onceans have 2 major life zone.

a) Coastal Zone :- shallow, relatively warm, ample sunlight.

b) open sea :- Deeper part, away form continental shelf.

* Open Sea is further divided into 3 parts:

=> Euphotic Zone : This Zone receives abundant amount of sunlight and shows high amount of photosynthetic activity.

=> Benthic / bathyal Zone :- It is host to sand, silt and decomposed material. This region is cold because not much light is observed in the Zone. starfishes, sponges as well as some micro-organisms besides in ~~the~~ this layer.

=> Abyssal Zone : The deepest part of the ocean. It has no primary source of energy. This Zone is very cold and pressurised. At its floor due to existance and movment tectonic plate H_2S and other minral which is consumed by organism.

* Estuarine :- An estuary is a semi closed coastal water body, which contains marine water mixed with fresh water form the surrounding area. It is strongly affected by tidal action. Estuaries have hich biodiversity.

4. Explain in detail different components of ecosystem.

⇒ Biotic components and abiotic component are mainly two types of ecosystem.

⇒ Biotic components includes living organism.

⇒ Abiotic components consists of non-living environmental entities.

* Abiotic component :-

The non living factors or the physical environment prevailing in an ecosystem form the abiotic component.

⇒ It mainly includes:

1. physical factor: climatic factors like precipitation, temperature, light, wind, humidity and edaphic factors like soil, pH, topography.

2. organic compounds:- carbohydrates, protiens, lipids and humic substances that link abiotic component to biotic components.

3. Inorganic compounds: They include water, minerals and gases.

⇒ These inorganic substances are required for synthesis of organic compounds and are called biogenetic substance.

* Biotic components:

(1) producers: organisms that make their own food by photosynthesis.

⇒ The green plants have chlorophyll with the help of which they trap solar and change it into chemical energy of carbohydrates using simple inorganic compounds namely water and carbon dioxide.

⇒ This process is known as photosynthesis. As the green plant manufactures their own food hence they are known as Autothophs.

⇒ Chemical energy stored by producers is utilised partly for their own development and remaining is stored for future growth.

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(2) consumers :- Species which lack chlorophyll and are unable to synthesis food on their own.

⇒ Therfore, they depend on other producer or their food, hence they are known as heterotrophs.

⇒ consumers are of four types :-

1. Primary consumers / First order / Herbivores consumers

2. Secondary consumers / second order / carnivores consumer

3. Tertiary consumers / Third order consumer

4. Quaternary consumers / fourth/h omnivores.

1. primary consumers :- These animals are which feed on the plant or the other produceh. They are called herbivores.

Ex:- Rabbit, dear, goat, cattle.

2. Secondary consumers :- The animals which fed on the herbivores are called secondary consumers.

Ex:- Cates, foxes, snakes etc

3. Tertiary consumers :- These animal feed on the secondary consumers.

Ex:- Wolves.

4. Quaternary consumers :- animals which feed on tertiary consumers are called quaternary consumers.

Ex:- Lions and tigers.

(3) Decomposers :-

⇒ Bacteria and fungi belong to these class.

⇒ They breakdown the dead organic mater of producer for their food and release to environment.

=) These substance are reused by the producer resulting in a cyclic exchange of materials between biotic community and abiotic environment of the ecosystem.

=) The decomposers are also known as saprothophs.

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5. Narrate in detail the energy flow in ecosystem.

=) To mange and maintain life energy is required.

=) In the process of photosynthesis, green plants take energy from sunlight to convert carbon dioxide into glucose to get energy.

=) This energy transfer from one trophical level to another. flow of energy in ecosystem is governed by two basic laws of thermodynamis

(i) Energy can neither be created nor destroyed but can be transferred from one state to another.

(ii) Each transfer of energy cause loss of energy within the ecosystem from one level to another i.e, from the producer

to primary consumer and from primary consumer to secondary consumer and so on.

=) During respiration, carbon double bond is broken and carbon is combined with oxygen to from carbon dioxide. This process release energy and around 90% energy is lost in between two thophical levels.

=) This flow energy within the ecosystem is unidirectional and does not recycle.

=) The flow of energy is unidirectional It starts from solar radition then gets to producer and then consumers.

=) No energy transmission 100% inefficien there will always be losses.

=) It means shorter the food chain the amount of energy recived is greater and vice versa.

=) To understand energy flow there are some models:-

=) Single channel, universal flow. y shape

6. Explain the term food chain with examples of aquatic and terrestrial ecosystem.

=) In the food chain each organism eat the smaller organism and gets eaten by the larger one.

=) All theis organism which are interlinked with each other through food, together makes the food chain.

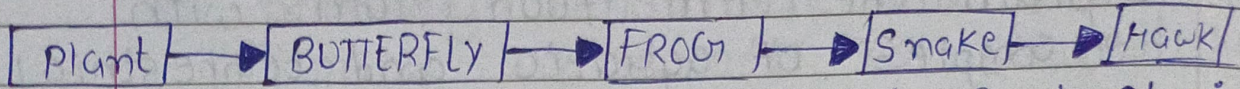
=) Different level of food chain is known as trophic level. Each food chain has three main trophic level: sunlight, producer, consumer, decomposer.

=) If any of this intermediate stage of food chain is removed the succeeding links are effected.

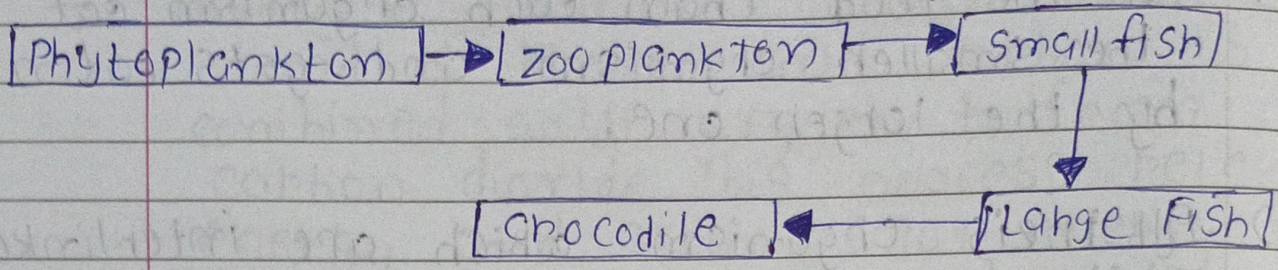
=) The arrangement of the food chain is shown in the fig.

=) It is estimated that only 10% the Phivious trophic level is made avilable at the succeeding trophic level

=) The efficiency of food is depended upon the number of trophic levels in the food chain.



Terrestrial food chain



Aquatic food chain

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6. Explain the term food

7. Describe the importance of biochemical cycle in biosphere. Describe carbon cycle with sketch in details.

⇒ The cyclic exchange of nutrient between organism and their non-living environment is called biogeochemical cycle.

⇒ As indecated by name nutrient circulate through life and through earth repeatedly.

⇒ various cycles are named on the bases of nutrient getting exchanged

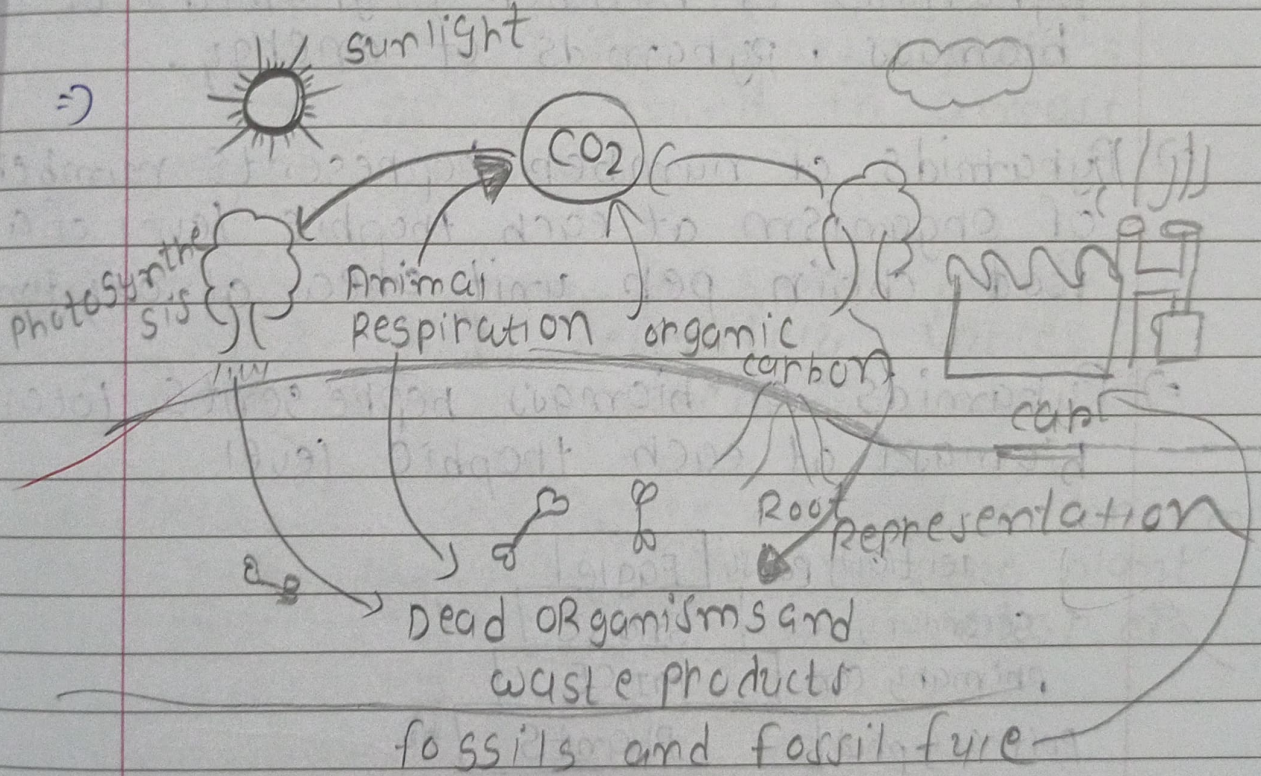
* carbon cycles:-

=> carbon in form of carbon dioxide is utilized by plants as a raw material for photosynthesis through which variety of carbohydrates and other organic substance are produced.

$$6CO_2 + 6H_2O \xrightarrow[\text{chlorophyll}]{\text{Sun radiations}} C_6H_{12}O_6 + 6O_2$$

(glucose)

=>



=> During respiratory action animals release carbon back to the surroundings as carbon dioxide

=> Interchange of CO_2 between atomsphere and ocean lakes place through diffusion

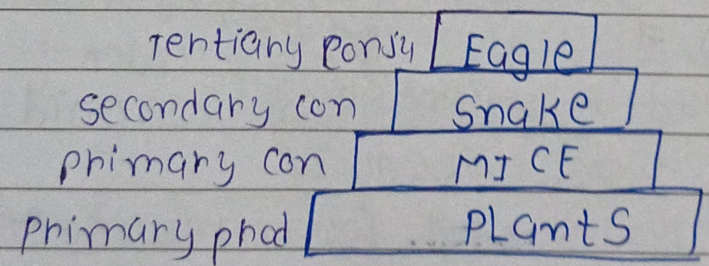
8. What is an ecological pyramid? Describe of mass and energy with sketch

⇒ Graphical representation of trophical structure and function of ecosystem, starting with producer at the base and succesive trophic level forming and apex in known as ecological pyramid.

⇒ Ecological pyramids are of three types: pyramids of number, Pyramids of biomass, pyramids of energy.

⇒ Pyramids of number represents number of organism at each trophic level of a food chain per unit area at any time

⇒ Pyramids of biomass represents total biomass at each trophic level



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9. Answer (A) what are Heterophs ?
(B) what are Herbivores.

(A) Aheterophs refers to an organisms that produces its own food. Futher more, such an organism relies on gaining nuthition from other sources of organic carbon.
Ex:- fungi, bacteria, parasitic

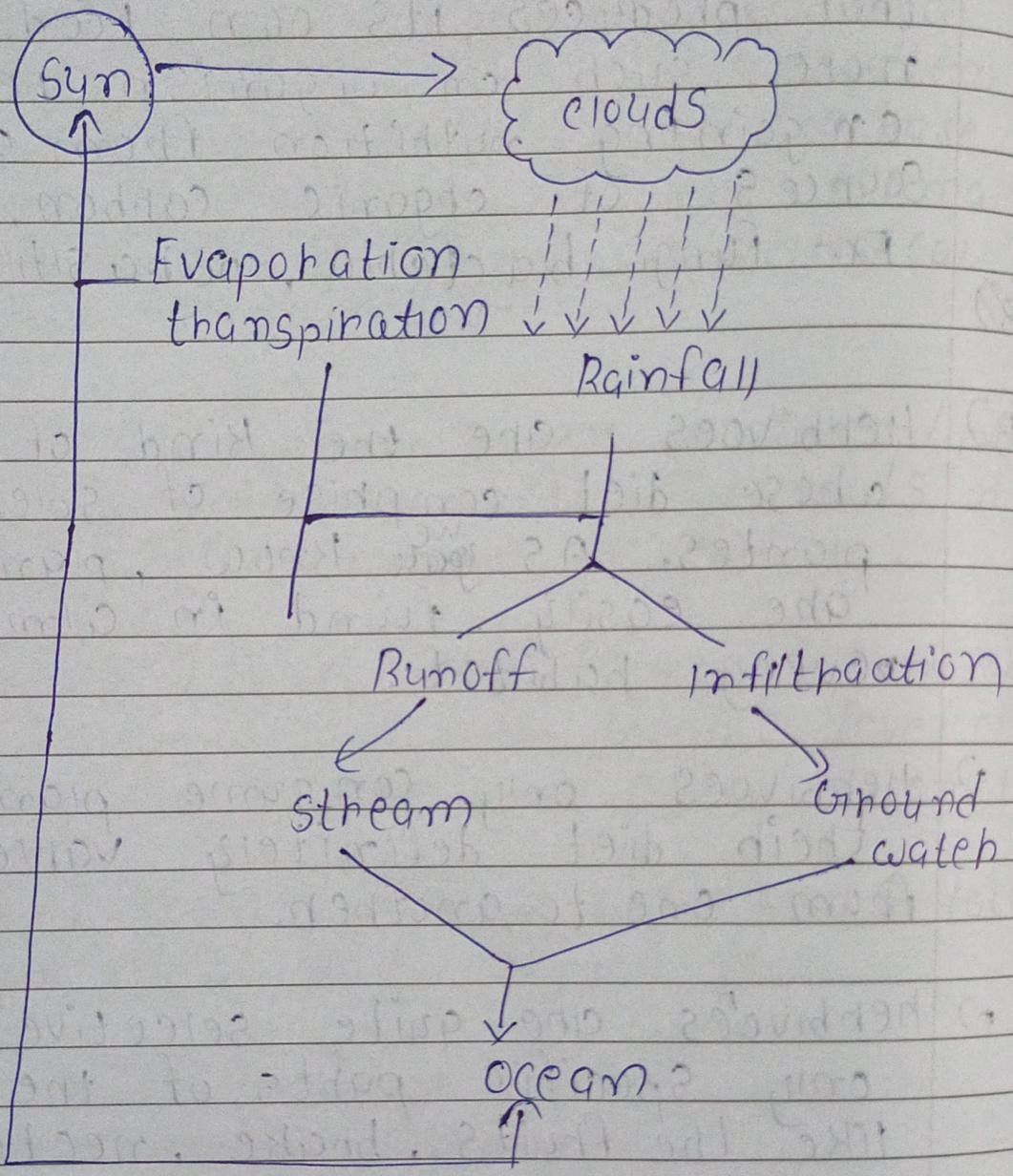
(B)

(B) Herbivoes are the kind of animals whose diet comphise of solely plantes. As we know, plants are easily found in almost every habitat.

=) Herbivoes only consume plants, their diet definitely varies from one to another.

=) herbivoes are quite selective consuming only specific parts of the plant like the fruits, brake, nectar or more.

10. Explain by drawing a sketch of the hydrological cycle.



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