

Chapter 12. Interaction Between Biotic and Abiotic Factors in an Ecosystem

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Solution 1:

Producers

Solution 2:

Consumers

Solution 3:

The climatic factors affecting ecosystem are sunlight, temperature, humidity, rainfall and wind.

Solution 4:

Low and high temperatures restrict the growth of plants and existence of animal species. Changes in temperature patterns will impact plant life which in turn will influence the animal life, since animals depend directly or indirectly on it for food. During extreme cold and hot conditions, animals either migrate to favourable places, some may hibernate or some may aestivate.

Solution 5:

Consumers which eat only plants are called consumers of the first order. Consumers that eat herbivores like deer, goats, grasshoppers, etc. are called consumers of the second order.

Solution 6:

Deserts have scanty water, either because there is little rainfall, or because the water evaporates very fast in deserts. Desert species are adapted to less amounts of water and they are capable of surviving for long periods of time in the scarcity of water. The growth of plants and animals and their vital functions are dependent on water intake. Hence water is a vital limiting factor in deserts due to the scant availability of this important resource.

Solution 7:

Abiotic components	Biotic components
These are the non-living factors affecting the organisms of an ecosystem.	These are the living organisms present in an ecosystem.
E.g. – Water, sunlight, temperature etc.	E.g. – Plants, animals, microbes etc.

Solution 8:

Primary producers	Secondary producers
These are autotrophic plants.	These are heterotrophic organisms.
They use sun's energy, water, air and chlorophyll to produce their own food.	They consume food and produce new types of organic substances while digesting their food.
Example - Green plants	Example - Fungi, animals

Solution 9:

Vital atmospheric gases are oxygen, carbon dioxide and nitrogen.

Oxygen availability seldom becomes a limiting factor for land animals unless they live in soil or invade high altitudes. Plants release oxygen into the air which is used by animals for respiration. During respiration, animals release carbon dioxide which is required by plants for photosynthesis. Nitrogen is an essential gas which is vital for the growth and sustenance of organisms.

Solution 10:

In a natural ecosystem, green plants capture solar energy and convert it into chemical forms. The energy is then passed onto herbivores when they feed on green plants. From herbivores, the energy moves into carnivores that eat them. Some animals like lion and vultures are not eaten by other organisms. All the organisms ultimately pass on energy to the decomposers. Energy thus flows continuously through the ecosystem from plant to animals and from prey to predator.

Solution 11:

Energy passes through the ecosystem in a one-way path. Energy goes through each trophic level, one at a time. As it goes from one level to another, it is lost due to metabolism and in the form of heat. For example - The energy ingested by producers is used by the producers for carrying out various life activities and some amount of energy is lost as heat, so that the entire energy does not pass completely to the consumers. The energy lost as heat cannot be used anymore.

Solution 12:

The transfer of energy from autotrophs through a series of organisms that consume and are consumed is known as a food chain.

Solution 13:

The types of food chain are:

1. Grazing food chain
 2. Detritus food chain
 3. Auxiliary food chain
- (Write any two)

Solution 14:

Individual food chains interconnected in a complex way is called food web.

Solution 15:

An energy pyramid is a graphical representation of the flow of energy from the producers through the various consumers. It shows the amount of energy available and the loss of useful energy at each step of the food chain in an ecosystem.

Solution 16:

As the energy gets transferred from lower trophic level to the higher one, there is a loss of large amount of energy due to metabolism and as heat. As a result very little energy (i.e. 10%) gets transferred to the next level. So the trophic level at the base has maximum energy and that at the top has the least amount of energy. Hence energy pyramid is broader at the base and narrower at the top.

Solution 17:

- (i) (a) unidirectional
- (ii) (d) producers and consumers
- (iii) (d) all the above
- (iv) (a) photosynthesis
- (v) (b) herbivores
- (vi) (b) bacteria, fungi, etc.
- (vii) (b) Communities and their physical environment
- (viii) (d) solar energy
- (ix) (d) biotic and abiotic
- (x) (d) high temperature and high rain