

For example, the spores of the soil bacterium *Bacillus thuringiensis* produce a crystal protein that kills larvae of certain insects. This bacterium was the first bio-pesticide to be used on a commercial scale worldwide and also the first bio-pesticide to be produced at commercial scale in India.

Certain bacteria and fungi are also being used for control of some weeds and diseases in various crops. The use of bio-pesticides can significantly reduce the dependence on chemicals for control of diseases, insects, and weeds.

Q5. Answer: A

Explanation: All trophic levels in an ecosystem are connected by transfer of food or energy. The transfer of energy from one trophic level to the next trophic level is called food chain. In a food chain the energy flows one way that is from producers through herbivores to carnivores. Besides the energy cannot be transferred in reverse direction. The amount of energy flow decreases with successive trophic levels. The producers capture only a small fraction of solar energy, and the bulk of unutilized energy is dissipated mostly as heat.

Q6. Answer: C

Explanation: The molecular nitrogen in the atmosphere is the ultimate source of nitrogen for the ecosystem. However, the molecular nitrogen in the atmosphere cannot be directly metabolised either by plants or by animals.

Native rocks do not contain any nitrogen, so they do not contribute nitrogen to the plants and animals. All the nitrogen accumulated in biomass, detritus and humus in various ecosystems is derived from the atmosphere by biological activities.

Molecular nitrogen enters the biological pathways of nitrogen cycle due to the activities of several free living and symbiotic nitrogen fixing microbes.

Nitrogen fixation in terrestrial ecosystems is mainly done by symbiotic microbes, whereas most of the nitrogen fixation in aquatic ecosystems is done by free-living microbes.

Q7. Answer: A

Explanation: The tropical rain forests are evergreen forests which possess highest standing crop biomass among all biomes. These forests are characterized by 30-40 m tall canopy structure with 4-5 strata formed by different plant species.

Because of high rainfall, the soil of tropical rain forests are highly leached and has low base content. Therefore, most of the nutrients are stored in the tall vegetation while the nutrient storage in the soil remains low.

In India the tropical rain forests are discontinuously distributed along the Western Ghats and in North-eastern Himalayas.