

CBSE Test Paper 05

Ch-14 Ecosystem

1. Fundamental ecosystem services are taken as granted because
 - a. They are provided by nature
 - b. They are easily available
 - c. They are priceless
 - d. They are free
2. The cost of nature's ecosystem services is about
 - a. Twice the global gross national product.
 - b. Five times the gross national product.
 - c. Half of the global gross national product.
 - d. Ten times the gross national product.
3. Phosphorus will not make part of
 - a. ATP
 - b. nucleic acids
 - c. teeth
 - d. amino acids
4. Among desert plants, which of the following will become a limiting for primary production
 - a. light
 - b. water
 - c. chlorophyll
 - d. temperature
5. The ecological niche of an organism will not represent:
 - a. resources it cannot utilize
 - b. range of conditions that it can tolerate
 - c. its functional role in the ecological system
 - d. its specialization
6. Man can be a primary as well as secondary consumer. Justify this statement.
7. The basic requirements for any ecosystem to function and sustain is solar energy.
(True/False)

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8. How much of carbon is fixed in the biosphere through photosynthesis annually?
 9. Write the name of four important functional aspects of ecosystem.
 10. What is productivity in ecosystem.
 11. Name the pioneer species:
 - (i) On a bare rock
 - (ii) in a water body.
 12. What is eltonian pyramid?
 13. Differentiate between Primary and Secondary succession.
 14. Name the type of food chain responsible for the flow of larger fraction of energy in aquatic and a terrestrial ecosystem respectively. Mention one difference between the two food chains.
 15. What is meant by ecological succession?

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Answer

1. d. They are free, **Explanation:** Researchers have put an average price tag of US \$33 trillion a year on these fundamental ecosystems services, which is largely taken for granted because they are free. This service includes nature's life support system without which life is not possible on this planet.
2. a. Twice the global gross national product, **Explanation:** a team of researchers from the United States, Argentina, and the Netherlands has put an average price tag of US \$ 33 trillion a year on these fundamental ecosystem services, which are largely taken for granted because they are free. That is nearly twice the value of the global gross national product (GNP) of US Dollar 18 trillion.
3. d. amino acids, **Explanation:** Phosphorus is not present in amino acids. Nucleic acids, ATP and Teeth contain phosphorus. Amino acids polymerise to form protein.
4. b. water, **Explanation:** Primary productivity of plants depends upon availability of water, sunlight, chlorophyll, carbon dioxide etc. but in desert plants water is the main limiting factor as very less amount of water is available to plants in deserts.
5. a. resources it cannot utilize, **Explanation:** Ecological niche of an organism represents range of conditions that it can tolerate, functional role in the ecological system but not the resources that are not utilized by organisms of an ecological niche.
6. Man can be a primary as well as secondary consumer because man eats plants as well as meat of other animals. So, man is herbivore as well as carnivore.
7. True, The synthesis and perpetuation processes involve energy exchange and this energy comes from the sun in the form of light or solar energy.
8. Most of the carbon is fixed in the biosphere through photosynthesis annually.

According to one estimate 4×10^{13} kg of carbon is fixed in the biosphere through photosynthesis annually.

9.

i. Productivity

ii. Decomposition

iii. Energy flow

iv. Nutrient cycling

10. The rate of synthesis of energy containing biomass by any trophic level per unit area in unit time is called its productivity.

It is expressed in terms of $g^{-2}yr^{-1}kcal\ m^{-2}yr^{-1}$

11. Pioneer species are hardy species which are the first to colonize previously disrupted or damaged ecosystems, beginning a chain of ecological succession that ultimately leads to a more biodiverse steady-state ecosystem.

i. The pioneer species on a bare rock are usually lichen, mosses and annual grass stage, and blue-green algae.

ii. Phytoplankton stage, Unicellular floating algal plants such as diatoms are pioneer species of a bare water body, such as a pond. Their spores are carried by air to the pond.

12. Eltonian pyramid or ecological pyramid is graphic representation of an ecological parameter such as number of individuals, biomass or energy present in various trophic levels of a food with producers forming the base and carnivores the top.

13.

Primary succession	Secondary Succession
1. It occurs in an area which is barren or lifeless.	1. Secondary succession occurs in an area which has been denuded recently and previously inhabited.

2. Soil is absent at the beginning of primary succession and the environment is not suitable for sustaining normal life forms.	2. Soil is present at the beginning of secondary succession with some organisms.
3. Primary succession takes a long time for completion, 1000 years or more.	3. Secondary succession takes a less time for completion, 50-200 years.
4. There is no humus in the beginning as soil is absent.	4. Humus is present from the very beginning by the decomposition of previous occupants.
5. Intermediary seral communities are many as it takes long time for reaching climax stage.	5. Intermediary seral communities are a few compared to primary succession.
6. Pioneer community comes from outside often crustose lichen in a barren rock.	6. Pioneer community develops partly from previous occupants and partly from migrants.
7. Reproductive structures or propagates of any previous community are absent. Secondary Succession	7. Reproductive structures of the previous occupants are present in the area.

14. In an aquatic ecosystem, GFC is the major conduit for energy flow. Whereas in a terrestrial ecosystem a much larger fraction of energy flow through the detritus food chain than through the GFC. Detritus food chain may be connected with the grazing food chain at some levels.

Difference between GFC and DFC

- Grazing food chain starts with green plants while detritus food chain starts with dead organic matter.
- Organic matter is decomposed in detritus but not in grazing.
- Grazing web adds energy into the ecosystem.
- Detritus has sub soil organisms while grazing web has macroscopic organisms.
- Grazing web helps in fixing inorganic nutrients. Detritus helps in fixing the inorganic nutrients.
- Grazing begins with green plants at the producer level while detritus begins

with decomposers at the first trophic level.

- Solar energy is used in grazing web. Energy for detritus comes from the remains of detritus.
- Less fraction of energy flows through grazing web as compared to detritus.

15. Ecological succession is the gradual process by which ecosystems change and develop over time. Nothing remains the same and habitats are constantly changing.

There are two main types of succession, primary and secondary.

- **Primary succession** is the series of community changes which occur on an entirely new habitat which has never been colonized before. For example, a newly quarried rock face or sand dunes.
- **Secondary succession** is the series of community changes which take place on a previously colonized, but disturbed or damaged habitat. For example, after felling trees in a woodland, land clearance or a fire.