

Diversity of Living World

Very Short Answer Questions:

1. Define the term Metabolism and give an example?

Ans. The sum total of all the chemical reactions occurs in the bodies of living organisms form metabolism. Anabolic process builds up or store or conserve energy. Catabolic processes involve in expenditure of energy.

2. What is Biogenesis?

Ans. The concept that “Life comes only from life” is known as biogenesis.

3. Distinguish between Embryology an Ethology?

Ans. a) Embryology deals with the study of events that lead to fertilization, cleavage, early growth and differentiation of zygote into an embryo.

b) Ethology is the study of the animal behavior based on the systematic observation, recording and analysis of functions of animals.

4. What is meant by Tautonymy? Give two examples?

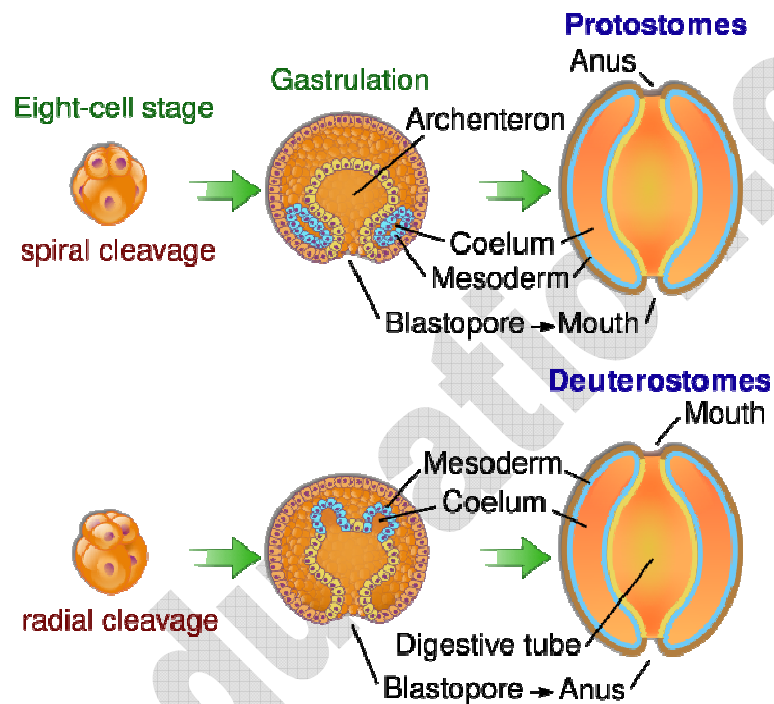
- Tautonymy is the practicing of naming the animals in which the generic name and species name are the same. The name is called tautonym.
- **E.g.:** i) Axis axis -- spotted deer ii) Naja naja – Indian cobra.

5. What is trinominal nomenclature? Give an example?

- Naming of organisms with three names like genus, species and subspecies.
- E.g:** Man – Homo sapiens sapiens, crow - Corvus splendens splendens

6. Differentiate between Protostomia and Deuterostomia?

- Eumetazoans in which blastopore develops into mouth first are known as protostomes. Phyla like Platyhelminthes, Nematoda, Annelida, Arthropoda and Mollusca belong to this category.
- Eumetazoans in which anus is formed first from or near the blastopore are known as deuterostomes. Mouth is formed secondarily in them.
- Phyla like Echinodermata, Hemichordata and Chordata belong to deuterostomia.



7. What is ecological diversity? Mention the three types of ecological diversities?

- Diversity at a higher level of organisation like ecosystem is known as ecological diversity.
- Three types of ecological diversity are
 - Alpha diversity. Related to a particular area/ community or ecosystem.
 - Beta diversity. Related to two adjacent ecosystems and calculated by comparing the number of taxa unique to each of the ecosystems.
 - Gamma diversity. Related to overall diversity for different ecosystems within an ecological region.

8. Define species richness?

- Species richness is the number of species per unit area. The more the number of species in an area it is known as species richness.

9. Mention any two products of medicinal importance obtained from nature?

- Two products of medicinal importance are
 - a) Digitalin to treat cardiac problems is extracted from the fox glove plant, *Digitalis purpurea*.
 - b) Anticancer drug, Vinblastin is extracted from *Vinca rosea*.

10. List out any four sacred groves in India?

Sacred Grove	State
1. Aravali Hills	Rajasthan and Gujarat
2. Chanda	Madhya Pradesh
3. Western Ghat Region	Karnataka and Maharashtra
4. Khasi and Jaintia Hills	Meghalaya
5. Sarguja, Bastar	Chhattisgarh

11. Write the full form of IUCN. In which book threatened species are enlisted?

- IUCN means International Union for the Conservation of Nature and Natural Resources.
- All the threatened species are listed in the Red Data Books published by IUCN.



12. How do you differentiate between growth in a living organism and nonliving object?

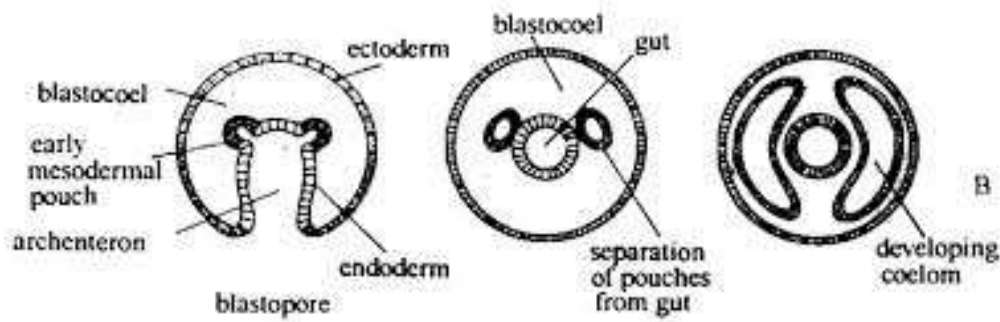
- Growth in living organisms is 'growth from inside'.
- Growth in non-living things is by accumulation of material on the surface.

13. Define the term Histology. What is it otherwise called?

- Histology is the study of microscopic structure of different tissues.
- It is also known as Microanatomy.

14. 'Echinoderms are enterocoelomates'. Comment?

- Echinoderms have true coelom which belongs to 'enterocoel' type formed by the out pouching of the archenteron.



Short Answer Questions

1. What are the reasons for greater biodiversity in the tropics?

Highest biodiversity appears in the tropical regions compared to other regions on the earth due to following reasons.

- ❖ 1. Tropical latitudes are more constant and predictable than that of the temperate regions. Constant environment leads to niche specialization which causes greater species diversity.
- ❖ 2. Tropical latitudes have remained relatively undisturbed for millions of years and thus had a long evolutionary time. It causes the species diversification.
- ❖ 3. Availability of abundant solar energy, resources like water etc., in this regions cause higher productivity in food production which leads to greater diversity.

2. What is the 'evil quartet'?

- ❖ Four major causes for threats to biodiversity are known as the evil quartet. They are

- | | |
|-----------------------------------|----------------------|
| 1. Habitat loss and fragmentation | 2. Over Exploitation |
| 3. Invasion of alien species | 4. Co-extinction. |

- ❖ **1. Habitat Loss and Fragmentation:** Deforestation leads to species extinction in forests. Conversion of forest land to agricultural land, pollution and fragmentation of habitat lead to extinction of species.

- ❖ **2. Over-Exploitation:** When we over utilize the natural resources it leads to over exploitation.

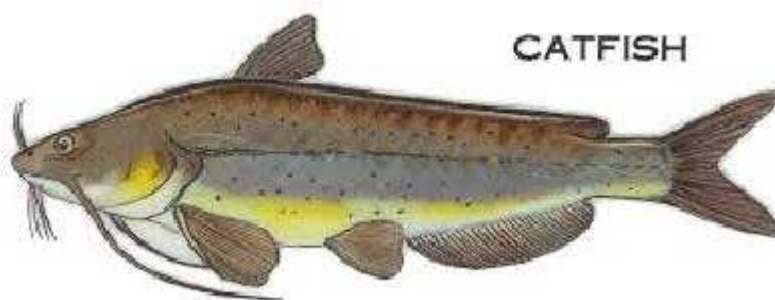
E.g.: Steller's sea cow, Passenger pigeon are extinct due to over – exploitation by humans.



Steller's sea cow of order **Sirenia** in class **Mammalia**

- ❖ **3. Invasion of Alien Species:** Alien species turn invasive and establish themselves at the cost of the indigenous species which are present naturally at a particular region.

- a) Nile perch led to extinction of 200 species of cichlid fishes in the Lake Victoria, East Africa.
- b) Exotic African catfish, *Clarias gariepinus* causes threat to indigenous cat fishes.



c) Introduction of weeds like the carrot grass, Parthenium; Spanish flag, Lantana; water hyacinth, Eichhornia damage our environment and causes the extinction of native species.

❖ **4. Co-Extinction:** if the host becomes extinct, the parasite also becomes extinct.

3. Define species. Explain the various aspects of 'species'?

- ❖ Species is the basic unit of classification.
- ❖ Buffon's biological concept of species explains that species is an interbreeding group of similar individuals sharing the common gene pool and producing fertile offspring.
- ❖ Species is considered as a breeding unit as the members of a species are reproductively isolated from the members of other species.
- ❖ Species is considered as an ecological unit as the members of it sharing the same ecological niche.
- ❖ Species is considered as a genetic unit as the members are showing similarity in the karyotype.
- ❖ Species is considered as an evolutionary unit as the members are having similar structure and functional characteristics.
- ❖ Dobzhansky introduced the concept of Mendelian Population while defining the species. A mendelian population is a group of sexually reproducing individuals within which mating takes place. They share a common gene pool. They show assortative mating.
- ❖ Species is dynamic as the populations of a species inhabiting different geographical areas are in a continuous process of adapting to the condition of their surrounding environments. It leads to the evolution of new species.

4. Explain in brief 'Biodiversity Hot spots'?

- ❖ The concept of Biodiversity Hot spots was proposed by Norman Myers.
- ❖ Biodiversity hot spot is a bio geographic region with a significant reservoir of biodiversity that is under threat of extinction from humans.
- ❖ Biodiversity hot spots are designated as Earth's biologically richest and most threatened terrestrial ecoregions.
- ❖ There are about 34 biodiversity hot spots are identified in the world.
- ❖ In India, 3 areas are designated as Biodiversity hot spots. They are
 - 1) Western Ghats and Sri Lanka
 - 2) Indo-Burma
 - 3) Himalayas.

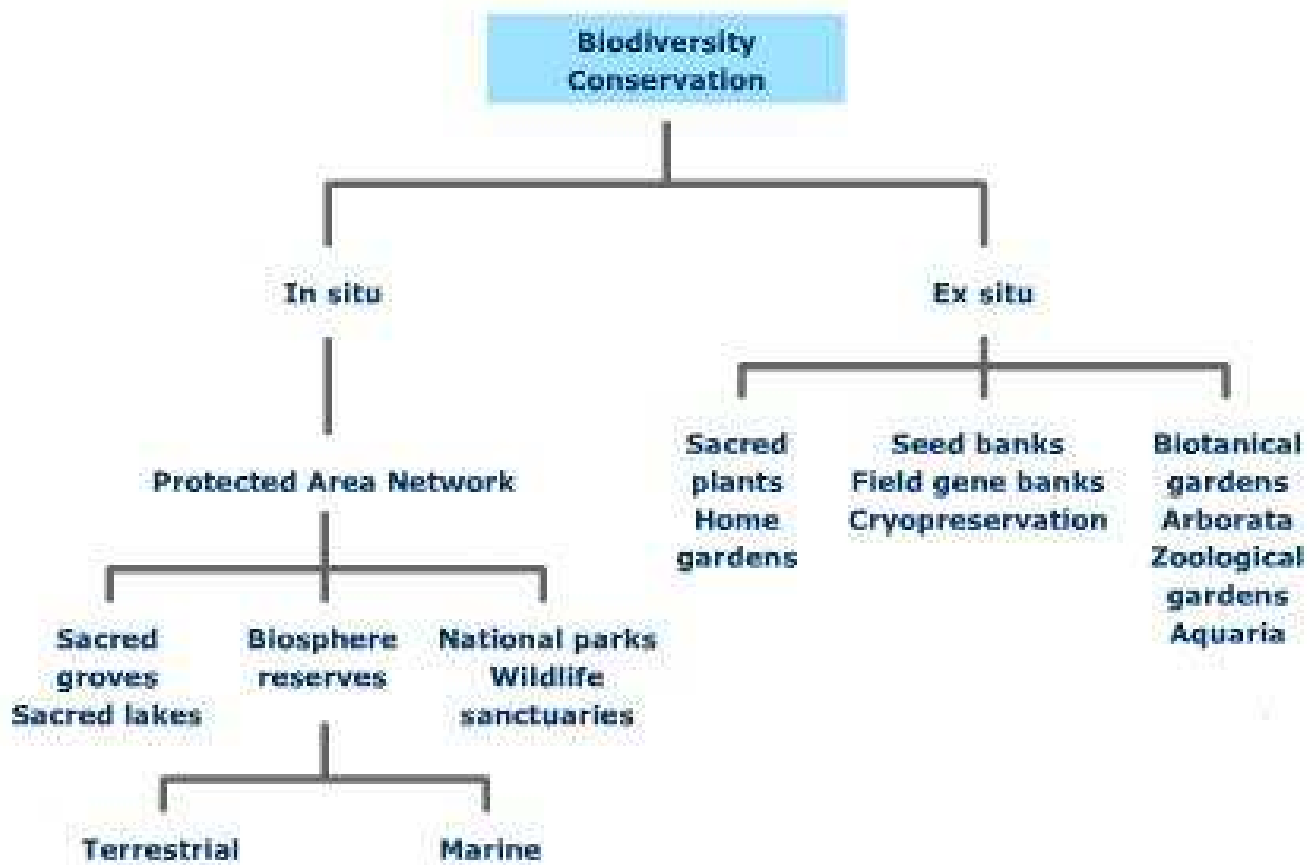
Biodiversity Hotspots of the World



5. Explain 'Rivet Popper' hypothesis?

- ❖ Paul Ehrlich proposed 'Rivet Popper hypothesis' to explain the role of species in ecosystem.
- ❖ He has taken an aero plane as an ecosystem.
- ❖ He explained how removal of one by one rivet (species of an ecosystem) of various parts can slowly damage the plane (ecosystem).
- ❖ Removal of a rivet from a seat or some other internal parts of plane may not damage the plane, but removal of rivet from a part supporting the wing can result in a crash.
- ❖ It means removal of a Critical species might affect the collapsing of entire community and ecosystem.

6. Write short notes on In-situ conservation?

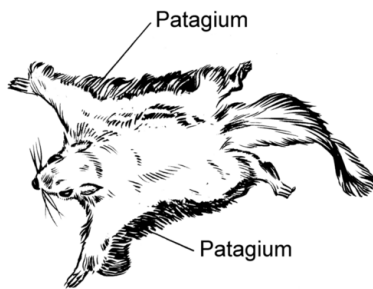


- ❖ In-situ conservation or On-site conservation is the process of protecting an animal species in its natural habitat.
- ❖ Ecologically unique and biodiversity rich regions are legally protected as in Biosphere Reserves, National Parks, Sanctuaries and Sacred Groves.
- ❖ Biosphere reserve is an area which set aside, minimally disturbed for the conservation of resources. In India, 17 biosphere reserves are present. Latest (17th) is Seshachalam Hills.
- ❖ A National Park is a natural habitat strictly reserved for protection of natural life. They offer a fascinating diversity of terrain, flora and fauna.
- ❖ Wildlife sanctuaries protect specific endangered faunal species which permit eco-tourism.
- ❖ Sacred groves are small groups of trees than a forest with special religious importance to a particular culture. In these regions, all the trees of wild life are respected and given total protection.

7. Explain the phylogenetic system of biological classification?

- ❖ Phylogenetic classification is an evolutionary classification based on how a common ancestry was shared.
- ❖ It summarizes the genetic distance between all species in the phylogenetic tree.
- ❖ In this classification, characters like analogous characters and homologous characters are taken into consideration.
- ❖ Analogous characters are the characters shared by a pair of organisms due to convergent evolution.

E.g.: Wings in sparrows and wing like patagia in flying squirrels.



- ❖ Homologous characters are the characters shared by a pair of organisms inherited from a common ancestor.

E.g.: Wings of sparrows and finches.

