Chapter 15
Biodiversity and Conservation

1 Marks Questions

1. Habitat loss and fragmentation has caused severe damage to a particular type of ecosystem. Name it.
Ans. Tropical Rain Forest.

2. What trend is observed in respect of species diversity when we move from equator to poles?
Ans. In general, species diversity decreases as we move away from the equator towards poles.

3. Which region is considered as the one with highest biodiversity on earth? What is the name given to such region. forests?
Ans. Amazonian rain forests. They are also called the 'Lungs of the planet'.

4. Ecologists have discovered that value of Z lies in range of 0.1 to 0.2 regardless of taxonomic group or region. When will the slope of line steeper in species area relationship?
Ans. Slope of line is much steeper if one analyses the species¡ Vs area relationship among very large areas like entire continents.

5. Define cryopreservation. Why is it useful in conserving biodiversity?
Ans. Preserving a material in liquid nitrogen at – 196°C. It can be done to preserve threatened species in viable and fertile condition for long period.

6. What is the reason for genetic variation shown by medicinal plant Rauwolfia vomitoria?
Ans. Genetic variation might be in terms of potency and concentration of the active chemical reserpine produced by plant.

7.Expand i) IUCN –
ii) MAB –
Ans. i) IUCN – International union of conservation of mature & natural resources
ii) MAB – man & biosphere programme.

8. What are hot spots?
Ans. Hot spots are the priority areas of conservation that are extremely rich in species have high endemism& under constant threat of extinction.

10.Name two most biodiversity rich zones of India?
Ans. Western Ghats & eastern Himalayas. 1

12.What is cryopreservation?
Ans. Cryopreservation is the storage of materials at ultra – low temperature either by rapid cooling or by grade cooling & simultaneous dehydration at low temp.

13.Write the scientific name of the plant that yields reserpine?
Ans. Rauwolfias vomitoria.

14.Name any two conventional methods of ex-situ conservation?

that a **Ans**. Botanical garden &zoological parks.

16.Name the national park for Rhinoceros & lion in India respectively?
Ans.Kaziranga national park &Gir National Park respectively.

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2 Marks Questions
1. How many species of plants and animals have been described by IUCN in 2004? What is global species diversity according to Robert May?
Ans. IUCN (2004) has described slightly more than 1.5 million species of plants and animals.
According to Robert May¡¦s estimates the global species diversity is about 7 million.

2. Explain co-extinction with a suitable example.
Ans. Coextinction refers to the disappearance of species with extinction of another species of plant or animal with which it was associated in an obligatory way. e.g., Plant-pollinator mutualism.

5."Species diversity of plants is much less than that of animals" Why?
Ans. The species diversity of plants is much less than that of animals because most animals possesses nervous system that control & coordinate various activities of animals. They also possess receptors to receive environmental stimuli some of these responses are adaptive & ensure survival of organism in changing environmental conditions.

6.What is the difference between in-situ & ex-situ conservation?
Ans.

In-situ conservation		Ex-situ conservation	
i).	It is the process of protecting the species in its natural habitat by protecting or cleaning up the habitat	i).	It is the process of protecting the species lay removing it from unsafe habitat & placing under car.
ii).	It helps in recovering population in the surroundings.	ii).	It help in recovering population under simulated conditions
iii).	eg. National park, Biosphere reserves.	iii).	eg. Botanical garden Gene bank.

8.Sometimes introduction of an exotic species upsets native species of the ecosystem. Substantiate the statement with the help of an example?
Ans. The alien species become invasive & compete with native species causing extinction of indigenous species e.g. introduction of African catfish (Clarias gariepinus) for aquaculture purposes, is posing threat to our. Indigenous catfish, (clarias bacterachus).

9.What do you mean lby species diversity? Name two measures of species diversity?
Ans. Species diversity refers to the variety of species within a region. The two important measures Of specie diversity are:-
i) Species richness:- It refers to number of species per unit area.
ii) Species evenness :- It refers to relative abundance with which each species is represented in an area.

10.What are sacred grooves? What is their role in conservation?
Ans. Sacred grooves are sacred forest patches around the places of worship. Tribal people do not allow to cut even a single branch of tree in these sacred grooves due to which many endemic species flourish in these region.

14.List the important attributes of a stable community?
Ans. i) It shall not show too much of variations in the year – to – year productivity.
ii) It must be either resistant or resilient to seasonal disturbances.
iii) It must be resistant to invasion by alien species.

16.Give reason why is it difficult to estimate global diversity for prokaryotes?
Ans. It is difficult to estimate climate diversity of prokaryotes because :-
i) Conventional taxonomic methods are not suitable for identifying microbial species.
ii) Many of these species cannot be cultured under laboratory conditions.
iii) Biochemical & molecular biology techniques would put their diversity into millions.

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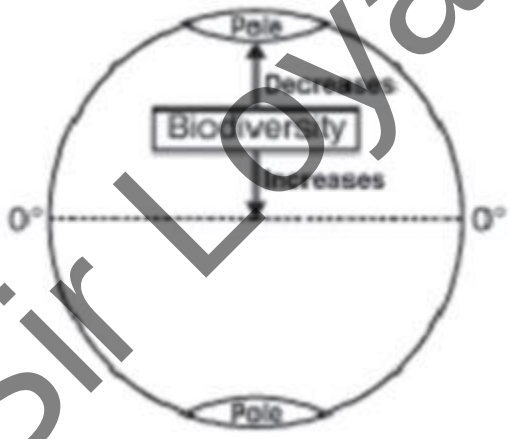
3 Marks Questions
1. Hot spots are the regions of exceptionally high biodiversity . But they have become regions of accidental habitat loss too. Name the three hot spots of our country. Why are they called 'Hot spot'?
Ans. Western Ghats and Sri Lanka; Indo-Burma; Himalaya called ¡¥biodiversity hot spots¡¦ as they show
(i) High level of species richness
(ii) High degree of

2. Study the diagram of the earth given below . Give the name of the pattern of biodiversity therein. Suggest any two reasons for this type of occurance.



Ans. Latitudinal gradients
(i) More solar energy available in tropics, more productivity.
(ii) Tropical environments are less seasonal, so more predictable.

3. What is so special about tropics that might account for their greater biological diversity?

Ans. a) Speciation is a function of time, unlike temperate regions subjected to frequent glaciations in the past, tropical latitude have remained relatively undisturbed for million of years and thus had long evolutionary time for species diversification

b) Tropical environment are less seasonal, more constant and predictable

c) More solar energy available in the tropics contributing to high productivity leading to greater diversity .

5.What do you mean by latitudinal gradient? What could be the possible reasons for diversity between tropic & temperate region?

Ans. Latitudinal gradient in diversity means that species diversity usually decreases as we move away from equator towards the poles, Tropic area of latitudinal range 23.50c harbor more species than temperate or polar area. Three hypothesis have been proposed to explain this difference:-

i) Speciation is a function of time, which temperate regions were subjected to frequent glaciations in the past, the tropics have remain unchanged & hence evolved more species diversity.

ii) As compared to temperate region, tropical environment are less seasonal, relatively more constant &predictable; such constant environment have promotes niche specialization & greater species diversity.

iii) There is more solar radiation avail able in tropical region this contributes directly to greater productivity &indirectly to greater species diversity.

6.Why is it necessary to conserve biodiversity?

Ans. The reasons for conserving biodiversity can be grouped into three categories.

i) Narrow utilitarian reasons:- Human beings derive a number of economic benefits like food, fibre, firewood, industrial product & medicinal products.

ii) Broad utilitarian reasons:- Biodiversity plays a major role in providing ecosystem services like :-

a) production of oxygen

b) Pollination of flowers, without which seeds or fruits are not produced.

c) Aesthetic pleasures like bird watching, watching spring flowers, walking through thick forest, working up to bulbul's song etc.

iii) Ethical reasons :- Every species has an intrinsic value even if it is not of any economic value to us-we have a moral duty to care for their well-being & pass on the biological legacy in a proper from to our future generation.

7.What is the relation between species richness & area? What is the significance of slope of regression?

Ans. Alexander Von Humboldt has observed that within a region, species richness increased with increase explored area but only up to a limit thus the relationship between species richness & area for a number of taxa is found to be a rectangular hyperbola. On a log scale, the relation ship becomes linear & is described lay equation

$\log S = \log C + Z \log A$

The values of slope of regression are identical regardless of the taxonomic group or the region. When such analysis is made among very large areas, the slope of regression would be much steeper.

8.What are the different approaches for biodiversity conservation in India?

Ans.T here are two major approaches for conservation of biodiversity:-

i) In-situ conservation :- It is the process of protecting the endangered species of plant or animal in the natural habitat lay either protecting or cleaning up the habitat or by

defending species from predators It includes:-
a) Biosphere Reserves:- There are 425 biosphere reserve in the world of which 14 are in India. Hot spots have been identified for maximum protection to endemic or endangered species.
b) National park or wildlife Sanctuaries:- India has about 90 national parks & 448 wildlife sanctuaries.
c) Sacred forests:- These are undisturbed forests without any human intervention & are surrounded by highly degraded landscapes.
ii) Ex- situ Conservation:- It is the process of protecting the endangered species of plants or animals by removing it from threatened habitat & placing them under care of humans. It includes :-
a) Botanical garden, zoological park and arboreta are conventional methods of ex-situ conservation
b) Cryopreservation to the storage of materials at ultra low temperature either by rapid cooling or by gradual cooling & simultaneous dehydration at low temperature.

10.What is the significance of Biodiversity to Human beings?
Ans. Biodiversity provide numerous direct or indirect services to human beings. These are-
i) Source of food & improved varieties:- Biodiversity directly or indirectly adds as the source of food, cloth& shelter.
ii) Fats & Oils:- A variety of plants are used to extract different kinds of oils.
iii) Fibres:- A variety of plants eg. cotton, hemp, jute are chief sources of fibres.
iv) Resins:- Resins are sticky exudation of plants.
v) Gums, Timber, Paper, Tannins, Dyes:- Plants species provide variety of useful products eg. gums, raisins, dyes, similarly animal species provide leather, fur, honey, silk, pearl etc.
vi) Drugs & Medicines:- Hiving organism also contain number of therapeutically useful substances.
vii) Stability of Ecosystem:- The food web, food chain energy flow in various tropic level & biochemical cycles occurs in natural ways without any hindrance if there is proper availability of diversified species
viii) Aesthetic, Scientific & Recreational values :- Indian people grow many plants because they regard them as sacred.

5 Marks Questions
1. Why is the sobriquet 'The Evil Quartet' used in context of biodiversity? Name the members of this quartet. Why do we grieve for the genes when a species is lost?
Ans. The 'Evil Quartet' is used as a sobriquet to refer to the cause of loss of biodiversity :
(i) Habitat loss and fragmentation :When large habitats are broken up into smaller fragments due to various human activities, the animals requiring large territories (elephants, birds etc.) are badly affected and their populations decline.
(ii) Over-exploitation :When need of a resource becomes greed. e.g., over exploitation of passenger pigeon led to its extinction. Also marine fish is at brink of being endangered due to over exploitations.
(iii) Alien species invasion :Intentional or non-Intentional introduction of a species to a nearby area may disturb the harmony of existing species. e.g., Eichhornia after introduction posed a big threat to the native species.
(iv) Co-extinction :Extinction of one species invariably leads to extinction of another when they are associated with each other in an obligatory way . e.g., when host species is extinct, obligate parasites dependent on it also die.

(v) We grieve for the loss of genes, because the wild forms are hardy and more resistant to pathogen attack and can be beneficial in crop breeding programmes.

2. Describe at least two approaches each for ex-situ conservation and in situ conservation as a strategy for biodiversity conservation.

Ans. In situ conservation :
(i) Identification and maximum protection of 'hot spots'
(ii) Legal protection to ecologically rich areas.
(iii) Biosphere reserves, national parks and sanctuaries
(iv) Sacred groves.
Ex situ Conservation :
(i) Creation of zoological parks, botanical garden, wild life sanctuary
(ii) Cryopreservation
(iii) Seed bank.

3.Mention the major causes for loss of biodiversity?

Ans. The four major causes for loss of Biodiversity are :-
i) Habitat loss & fragmentation of crops or conversion into grassland for raising beef-cattle. Total loss of habitat deprives many plants & animals their hone & they face extinction. Similarly when a large Habitat becomes fragmented, animals requiring large territory& those with migratory habits are adversely affected.
ii) Over exploitation :- when nature is over-exploited be man for natural resources, many species become extinct.
iii) Invasion of alien species:- The alien species became invasive & compete with native species & cause extinction of indigenous species.
iv) Co-extinction:- Co-extinction is a phenomenon in which when a species become extinct, the plant &animal species associated with it in an obligatory manner & become extinct