CBSE Class 12 Biology
Important Questions
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.

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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.

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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'.

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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¡Varea relationship among very large areas like entire continents.

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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 Rauwolfiavomitoria?

Ans.Genetic variation might be in terms of potency and concentration of the active chemical reserpine produced by plant.

Invertebrates

Taxa of Plants
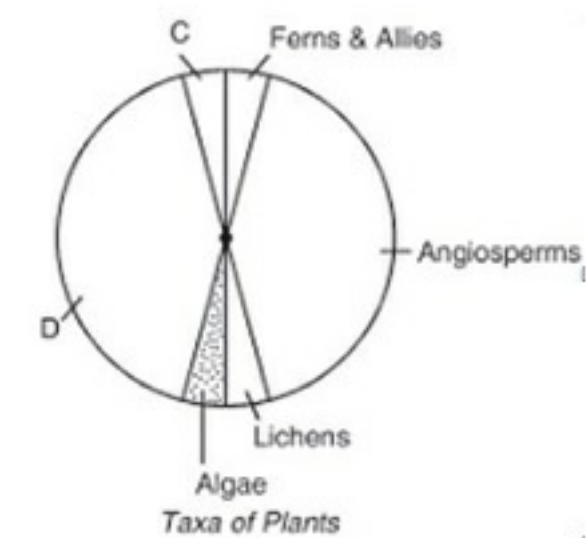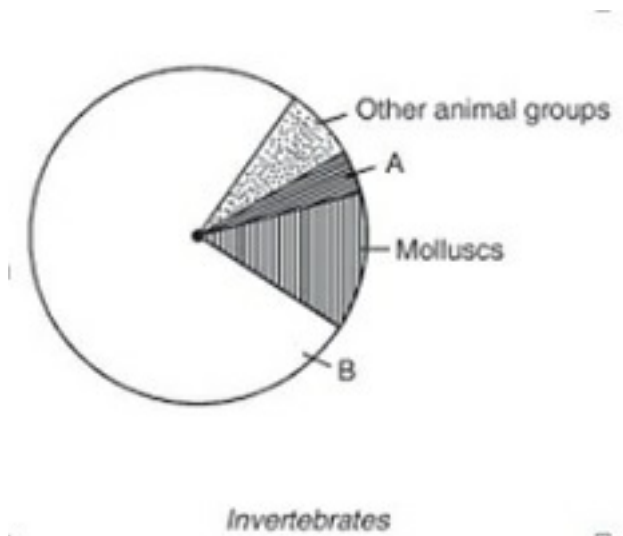
7.Expand i) IUCN -

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.

9. Name any two threatened animal species of India?

Ans. Swamp Deer & Great Indian Rhinoceros

10.Name two most biodiversity rich zones of India?

Ans. Western Ghats & eastern Himalayas. [1]

11.Expand : i) – WWF

ii) - IBWL

Ans.i) WWF – World wildlife fund

ii) IBWL – Indian Board of wild life.

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. Rauwolfiaserpentina.

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

Ans. Botanical garden &zoological parks.

15.What do you mean by "vulnerable species"?

Ans.Species that are believed to move into endangered species category in the near future if the causal factors continue operating are called vulnerable species.

16.Name the national park for Rhinoceros & lion in India respectively?

Ans.Kaziranga national park &Gir National Park respectively.

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.

3. Study the pie-diagram and answer the questions which follows :

What do A, B, C and D represent in these diagrams.

Ans.A →Crustaceans B →Insects

C →Mosses D →Fungi

4.What is IUCN red list? Give any two uses of this list?

Ans. IUCN (International union of conservation of nature & natural resources) maintains a "Red datalist" which is a catalogue of taxa facing risk of extinction. The main purpose of this list:-

i) to identify & document the species with high risk of extinction.

ii) to provide awareness to the degree of threat to biodiversity.

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.

7.“Amazonian rain forest in south America has the greatest bio-diversity on earth”. Justify the statement.

Ans.Amazonian rain forest in south America has the greatest biodiversity on earth; it harbors about40000 species of plants, 1,25,000 species of insects, 3000 species of fishes, 427 of amphibians, 378 ofreptiles, 1300 of birds & 427 of mammals.

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 (clariasgariepinus) for aquaculture purposes, is posing threat to our. Indigenous catfish, (clariasbacterachus).

9.What do you mean lay species diversity? Name two measures of species diversity?

Ans.Species diversity refers to the variety of species within a region. The two important measuresOf 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 notallow to cut even a single branch of tree in these sacred grooves due to which many endemicspecies flourish in these region.

11.What do you mean by IPR. What are the drawbacks of IPR.

Ans.IPR refers to Intellectual property rights, under which transformed plants, animals ormicroorganisms can be patented & become exclusive private property.

Drawbacks of IPR:-

i) Increase in price of seeds

ii) Greater domination of agriculture by multinational companies.

iii) Slower diffusion of new varieties

iv) Replacement of local varieties by exotic varieties.

12.Which type of conservation measures – in situ or ex-situ will help the larger number of species to survive? Explain.

Ans. In-situ conservation will help the larger number of species to survive because it providesnatural environment for growth & development of species.


13.What is Biodiversity? Why has it become important recently?

Ans. Biodiversity means the variability among living organisms from all sources including interaliaterrestrial, marine & other aquatic ecosystem & ecological complexes of which, they are parts, thisincludes diversity within species, between species & of ecosystem. In modern times,industrialization civilization, urbanization has developed to large scale use of different species ofplants& animal as a result of which life of several species of organism has been endangered thus,Biodiversity has become so important in recent times.

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.

15.Given below are the representation of global diversity of invertebrates & vertebrates.

Invertebrates   Vertebrates
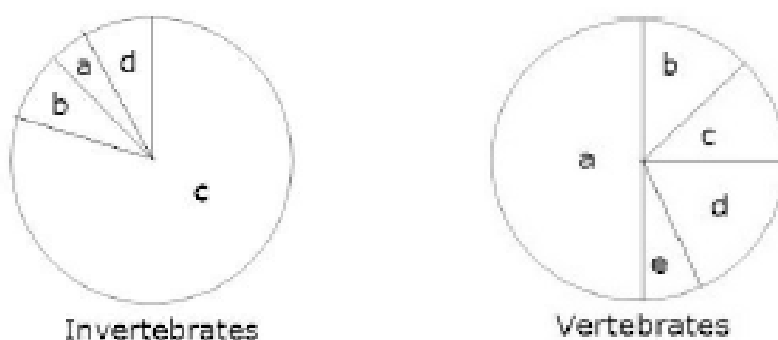
Mention the class of organism which belongs to each group in this representation.

Ans.

	Invertebrates		Vertebrates
a-	Crustaceans	a-	Fishes
b-	Molluscs	b-	Mammals
c-	Insects	c-	Birds
d-	Other animal groups	d-	Reptiles
		e-	Amphibians

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.

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.Westerm 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.
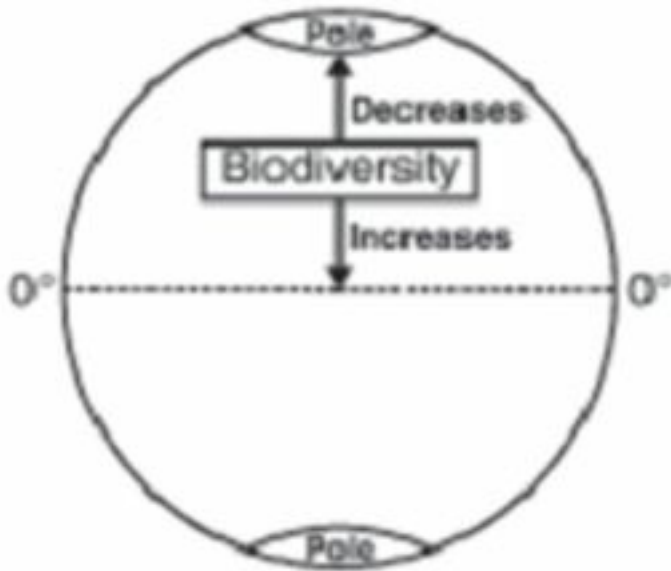
Ans. Latitudinal gradients

(i) More solar energy available in tropics, more productivity.

(ii) Tropical environments are less seasonal, so more predictable.

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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 const ant and predictable

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

4.What do you mean by biodiversity? What are the different types of Biodiversity?

Ans. Biodiversity can be defined as the totality of genes species & ecosystem of a given region.

Three important components of Biodiversity are:-

i) Genetic Biodiversity:- It refers to the diversity of genes within a species, Greater the genetic diversity amongorganisms of a species. More sustenance it has against environmental perteburations whereas geneticallyuniform populations are highly prone to diseases or harsh environment

ii) Species Biodiversity:- It refers to variety of species within a region. It has two important measures :-

a) Species richness:- i.e. number of species per unit area.

b) Species evenness:- i.e. abundance with which each species is represented in an area.

iii) Ecosystem Biodiversity:- It refers to variation of habitats, community types & abiotic environment present in an area. It is further of three types:-

a) α - diversity- It refers to number of species in a given community.

b) β- diversity – biodiversity which appears in range of communities due to replacement ofspecies with change in community is called β- diversity.

c) γ- diversity – It refers to diversity of habitats over the total geographical area.

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 fromequator towards the poles, Tropic area of latitudinal range 23.50c harbor more species than temperate orpolar 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, workingup 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-wehave a moral duty to care for their well-being & pass on the biological legacy in a proper from to ourfuture 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 withincrease explored area but only upto a limit thus the relationship between species richness & area for anumber of taxa is found to be a rectangular hyperbola. On a log scale, the relation ship becomes linear & is described layequation

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 ofregression would be much steeper.

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

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

i) In-situconservation :- It is the process of protecting the endangered species of plant or animal in thenatural habitat lay either protecting or cleaning up the habitat or by defending species from predators Itincludes:-

a) Biosphere Reserves:- There are 425 biosphere reserve in the world of which 14 are in India. Hotspotshave 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.

9.Give an account of Biodiversity in India?

Ans. India is one of the 10th mega biodiversity countries of the world because of the presence of variety ofclimatic conditions prevailing on different ecological habitat ranging from tropical, subtropical,temperate, So far as biodiversity of India is concerned, it comprises about 47,000 plants & 81,000 animalspecies. India occupies 2-4% of total land area of would but in terms of biodiversity, India contributeabout 10-35% of global diversity.

A large number of species is native of India. About 5000 species of flowering plants belonging to 141genera& 47 families had a birth in India. There are 62% of amphibian species& 50% of lizards endemicto our country with large number in Western Ghats. India is an origin place of 166 species of crop plants& 320 species of wild relatives of cultivated crop. India is rich in marine biodiversity lying along coastlineof 7500 km. There are two hotspots located in India out of 25 in would – These are Western Ghats&Eastern Himalayas.

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 & biochemicalcycles 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 regardthem 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 ofbiodiversity :

(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 thenative 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 ofhabitat deprives many plants & animals their hone & they face extinction. Similarly when a large Habrabecomes fragmented, animals requiring large territory& those with migratory habits are adverselyaffected.

ii) Over exploitation :- when nature is over-exploited be man for natural resources, many speciesbecome extinct.

iii) Invasion of alien species:- The alien species became invasive & compete with native species & causeextinction 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