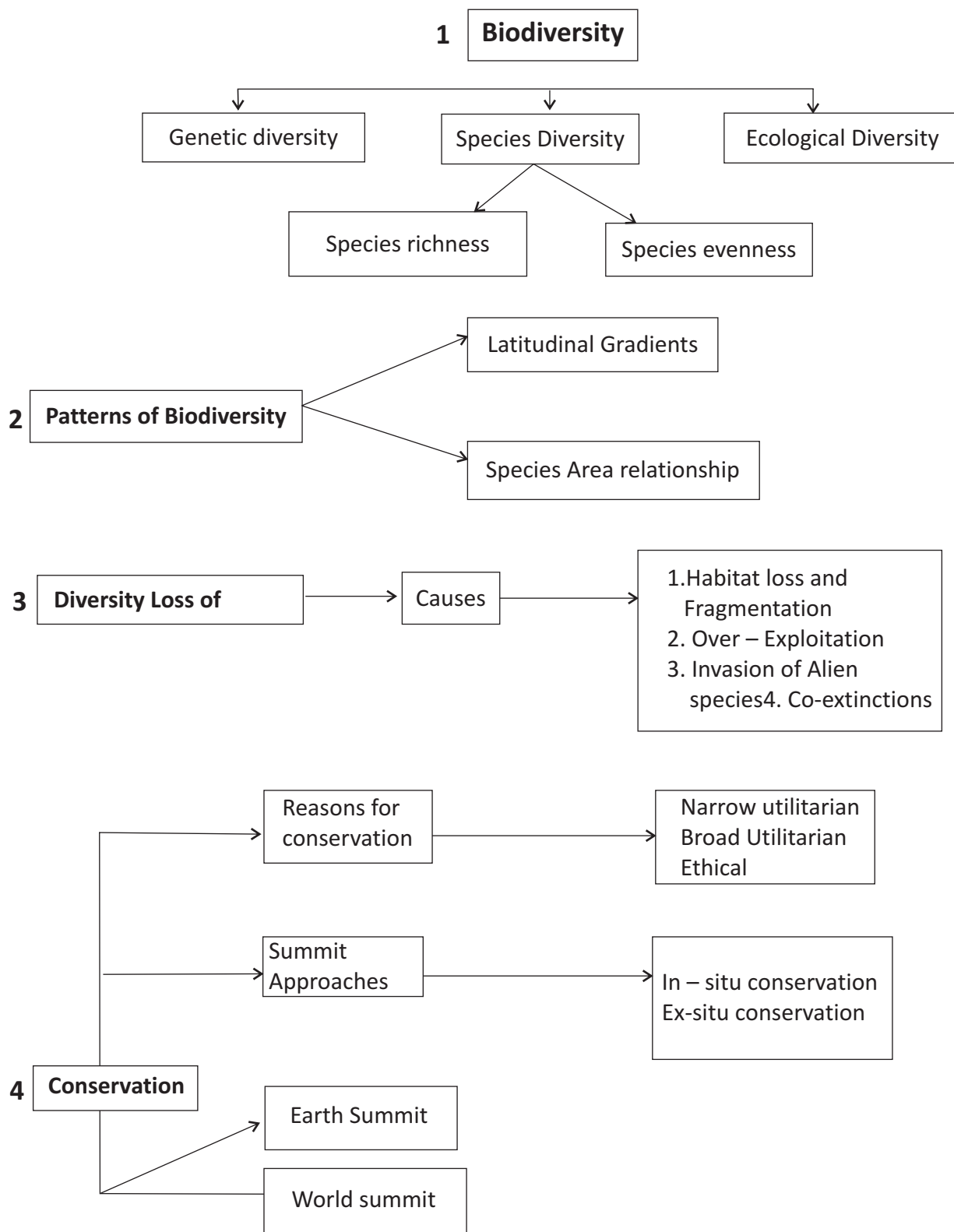


**CHAPTER:15 BIODIVERSITY AND CONSERVATION
(KEY POINTS)**

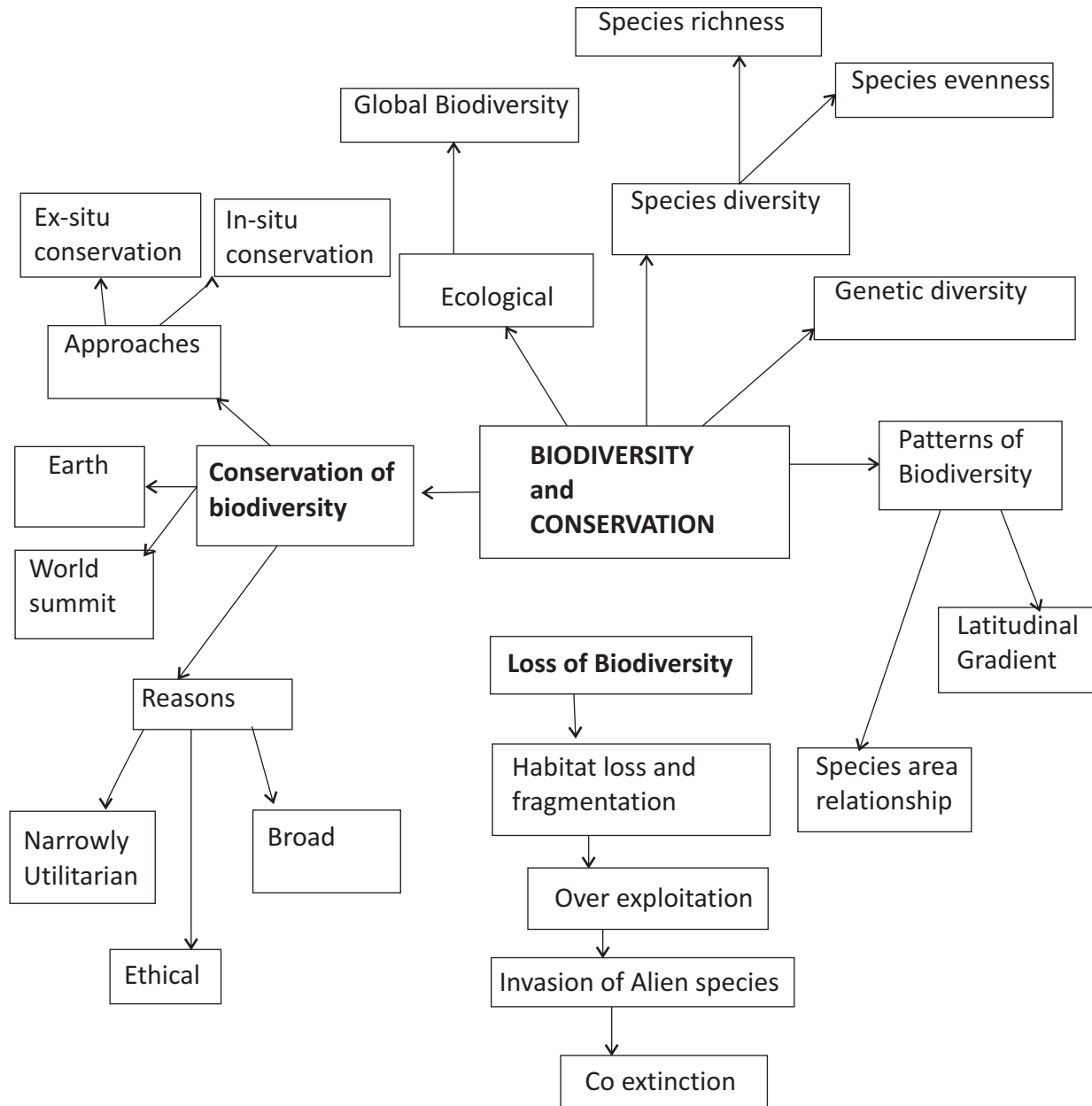
S.No	Term	Explanation
1	Biodiversity	refers to the sum total of diversity that emits all levels of biological organization
2	Genetic diversity	a single that shows high diversity at the genetic level over its disributional range
3	Species diversity	the diversity at the species level
4	Ecological diversity	the diversity at the ecosystem level
5	Bioprospecting	exploring molecular , genetic and species level diversity for product of economic importance
6	Sacred grooves	tracts of forests were set aside and all the trees and wildlife within were venerated and given total protection
7	Evil Quartet	Sobriquet use to describe 4 major causes of species extinction=Habitat loss & Fragmentation ,Over exploitation ,Alien species invasion &Coextinctions
8	Insitu Conservation	Conservation of species in their natural habitat that is on site conservation
9	Exsitu Conservation	Conservation of threatened species in special settings where they are protected & given special care that is off site conservation .Eg-zoological parks ,Botanical gardens ,etc.
10	Biodiversity Hotspots	Regions with very high levels of species richness
11	Sacred Groves	Tracts of forests where all trees & wild life within are venerated & given total protection
12	The Earth Summit	Meeting of several nations at Rio de Janeiro in 1992 to discuss appropriate measures for conservation of Biodiversity
13	World Summit on Sustainable Development	Meeting of several nations In Johannesburg, South Africa in 2002 to reduce the rate of biodiversity loss
14	Endemism	Species confined to a region & not found elsewhere



**CHAPTER:15 BIODIVERSITY AND CONSERVATION
(FLOW CHART)**



**CHAPTER:15 BIODIVERSITY AND CONSERVATION
(CONCEPT MAP)**



CHAPTER:15 BIODIVERSITY AND CONSERVATION (QUESTION BANK)

1. Why is India said to have greater ecosystem than Norway?
2. Write the importance of cryopreservation in conservation of biodiversity.
3. The amazon rain forest is referred to as 'the lungs of the planet'. Mention any one human activity which causes loss of biodiversity in this region.
4. About 20 species of a Cichlid fish became extinct when a particular fish was introduced in Lake Victoria of Africa. Name the invasive fish.
5. What is the expanded form of IUCN?
6. Why is genetic variation important in the plant *Rauwolfia vomitoria*?
7. What is meant by 'alien species' invasion? Name one plant and one animal alien species that are threat to our Indian native species.
8. Why should biodiversity be conserved? List any two ethical arguments in this support.
9. State the use of biodiversity in modern agriculture.
10. Differentiate between in situ and ex situ approaches of conservation of biodiversity?
11. Explain taking one example, the effect of co-extinction on biodiversity?
12. In the biosphere, immense biological diversity exists at all levels of biological organization. Explain any two levels of biodiversity?
13. What does the term genetic diversity refer to? What is the significance of large genetic diversity in a population?
14. The sacred grooves of Aravalli hills and Ooty botanical garden, both aim at biodiversity conservation. How do they differ in their approaches? Explain.
15. Alien species are highly invasive and are a threat to indigenous species. Substantiate this statement with any three examples.
16. List the reasons that account for the greater biological diversity in tropics?
17. Explain giving one example, how co-extinction is one of the causes of loss of biodiversity. List the three other causes also (without description).
18. Explain 'Rivet popper hypothesis' name the ecologists who proposed it.
19. What are the two types of desirable approaches to conserve biodiversity? Explain with examples bringing out the difference between the two types.
20. a) Taking one example each of habitat loss and fragmentation, explain how the two are responsible for biodiversity loss.
b) Explain two different ways of biodiversity conservation.
21. Isah Upanishad says 'let no one species encroach over the rights and privileges of other species. One can enjoy nature by giving up greed'. But human activities have accelerated the rate of extinction of species in recent times.
(a) Name any four such mass activities.
(b) Describe how each of these activities leads to loss of biodiversity.
(c) What value is taught by the Upanishad?
22. During an excursion to a botanical garden, the teacher shows an old tree which was on the verge of extinction. As soon as the teacher advanced with the students, some enthusiastic students climbed up the tree and started cutting the branches, collecting its leaves as precious collection. Rajesh instead took photographs of the tree from various angles. The boys mocked at Rajesh while the teacher appreciated him.
a) What values did Rajesh possess?
b) Why should we conserve biodiversity?
c) How can be biodiversity be conserved?

**CHAPTER:15 BIODIVERSITY AND CONSERVATION
(ANSWER KEY)**

Q. No.	Hints	marks				
1.	India has a number of ecosystems like deserts, rain forests, coral reefs, mangroves, wetlands, estuaries and alpine meadows, hence, it has greater ecosystem diversity than Norway.	1				
2.	Gametes of threatened species can be preserved in viable and fertile conditions for long periods using cryopreservation.	1				
3.	a) Many plants are cut and land is cleared for cultivation of soya bean. b) Conversion of forest land into grassland for raising beef cattle.	1				
4.	Nile perch	1				
5.	International union for conservation of nature and natural resources.	1				
6.	Genetic variation in Rauwolfia is shown in terms of potency and concentration of the active chemical reserpine produced by the plant.	1				
7	The introduction of Nile perch into lake Victoria led to the extinction of more than 200 species of cichlid fish in that lake, Introduction of African catfish clarkiasgariepinus for aquaculture poses a threat to the indigenous catfishes in Indian rivers. Carrot grass and lantana introduced into our country have become invasive and caused environmental damage; they pose a threat to the native species of plants in our forests.	2				
8	Biodiversity must be conserved as it plays an important role in many ecosystem services. a) Spiritually or philosophically, we have to realize the every species has an intrinsic value, though it may not be of any economic value to us currently. b) Morally, we have a duty to care for well-being of the species and pass on our biological legacy in good order to future generations.					
9.	<ul style="list-style-type: none"> • Human beings obtain food, fibers, medicines and many industrial products from plants. • The wild relatives of our crops are useful as a source of disease-resistance, pest-resistance and many desirable characters; they are used in breeding of plants to raise plants with desirable traits. • With increasing resources put into bioprospecting, exploring molecular genetics and species level diversity for economically important products, rich biodiversity will be beneficial. 					
10	<table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 50%; text-align: center;">In situ</th> <th style="width: 50%; text-align: center;">ex situ</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> - It is the method of protecting the endangered species of the plants or animals in the natural habitat, either by protecting or cleaning up the habitat itself or by defending species from predators. - It helps in recovering populations in the surroundings where they have developed their distinct features. </td> <td> <ul style="list-style-type: none"> - It is the method of protecting endangered species of plants and animals by removing them from the unsafe or threatened habitat and placing under the care of humans. - It helps in recovering populations or preventing their extinction under simulated conditions that closely resemble their natural habitats. </td> </tr> </tbody> </table>	In situ	ex situ	<ul style="list-style-type: none"> - It is the method of protecting the endangered species of the plants or animals in the natural habitat, either by protecting or cleaning up the habitat itself or by defending species from predators. - It helps in recovering populations in the surroundings where they have developed their distinct features. 	<ul style="list-style-type: none"> - It is the method of protecting endangered species of plants and animals by removing them from the unsafe or threatened habitat and placing under the care of humans. - It helps in recovering populations or preventing their extinction under simulated conditions that closely resemble their natural habitats. 	2
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11	<p>Co-extinction leads to loss of biodiversity because when a species become extinct, the plant and animal species associated with it in an obligatory manner, also become extinct.</p> <p>- In case of a co-evolved plant-pollinator mutualists, extinction of one of them invariably leads to the extinction of the other.</p>	2
12	<p>- Humans depend on nature for food and shelter: -But over-exploitation of natural resources has led to extinction of many species in the last 500 years, e.g., Steller's sea-cow and passenger pigeon, are lost due to over-exploitation.</p> <p>- Many marine fish populations around the world are over-exploited thus enhancing the continued existence of some commercially important species. Levels of biodiversity:</p> <p>- Genetic diversity refers to the diversity of genes within a species, e.g., there are more than 50,000 genetically different strains of rice in India.</p> <p>- Species diversity refers to the number of different species within a species within a given region, e.g., Western Ghats have a greater amphibian species diversity than Eastern Ghats.</p> <p>- Ecological diversity refers to variation of habitats, community types and abiotic environments present in a given area.</p> <p>- India has a greater ecosystem or ecological diversity than Scandinavia.</p>	2
13	<p>Genetic diversity refers to the diversity of genes within a species.</p> <p>Genetic diversity is important for the following reasons:</p> <p>- Greater the genetic diversity among organisms of a species, more sustenance it has against environmental perturbations.</p> <p>- Genetically uniform populations are highly prone to diseases and harsh environment.</p>	2
14	<p>The sacred groves are a part of in situ conservation while Ooty botanical garden is a part of ex situ approach.</p>	2
15	<p>- The Nile perch introduced into Lake Victoria in East Africa caused extinction of more than 200 species of cichlid fish in that lake.</p> <p>- Parthenium, -Lantna and Eichhornia caused environmental damage and posed threat to many species in our country. Illegal introduction of African catfish, Clariasgariepinus for aquaculture purposes is posing a threat to the indigenous catfishes in our rivers.</p>	3
16	<p>- Speciation is a function of time; the temperate regions were subjected to frequent glaciation in the past, while the tropics have remained undisturbed and hence had longer time to evolve more species diversity.</p> <p>- The tropical environments are less seasonal and relatively more constant and more predictable than temperate regional speciation has been promoted/favored by such constant environments and haven there is greater species diversity.</p> <p>- There is more solar radiation available in the tropical region; this contributes directly to more productivity and indirectly to greater species diversity.</p>	3
17	<p>Co-extinction is a phenomenon in which when a species becomes extinct, the plant and animal species associated with it, in an obligatory manner, also become extinct.e.g.,</p> <p>- In case of a co-evolved plants and its pollinator, if one of them becomes extinct, invariably the other one becomes extinct.</p> <p>-If a host fish becomes extinct, the unique parasites depending on it would also become extinct.</p> <p>The three other causes are:</p> <p>(I) Habitat loss and fragmentation</p> <p>(ii) Over-exploitation</p> <p>(iii) Invasion of lien species</p>	3

18	<p>Rivet- Popper Hypothesis</p> <ul style="list-style-type: none"> - It was proposed by Paul Ehrlich. - In an airplane all parts are joined together using thousands of rivets. - If every passenger travelling in it, starts popping a rivet to take home, it may not affect the flight safety initially, but as more and more rivets are removed, the plane becomes dangerously weak over a periods of time. -Further, which rivet is removed may also be critical; i.e., loss of rivets on the wings. <p>Key species that drive major ecosystem function is obviously a more serious threat to flight safety than loss of a few rivets on the seats or windows inside the plane.</p>	3				
19	<p>(a) The two desirable approaches to conserve bio diversity are:</p> <ol style="list-style-type: none"> 1. In situ conservation and 2. Ex situ conservation <table border="1" data-bbox="227 792 1382 1104"> <thead> <tr> <th data-bbox="227 792 799 828">In situ</th> <th data-bbox="805 792 1382 828">ex situ</th> </tr> </thead> <tbody> <tr> <td data-bbox="227 838 799 1104"> <p>It is the method of protecting the endangered species of the plants or animals in the natural habitat, either by protecting or cleaning up the habitat itself or by defending species from predators.</p> <p>It helps in recovering populations in the surroundings where they have developed their distinct features.</p> </td> <td data-bbox="805 838 1382 1104"> <p>It is the method of protecting endangered species of plants and animals by removing them from the unsafe or threatened habitat and placing under the care or humans.</p> <p>It helps in recovering populations or preventing their extinction under simulated conditions that closely resemble their natural habitats.</p> </td> </tr> </tbody> </table> <p>(b) It is the case of co-evolution.</p> <ul style="list-style-type: none"> - The orchid Oshryemploy’s sexual deceit’ to get pollinated by the specific bumble bee. - One petal of its flower beers uncanny resemblance to the female of the bee, in size, color and markings. - The male bee perceives it as a female psudocopulates with it; during the process of pollen brought by the bee from the bee from another orchid flower is dusted on the stigma. - If the occurs a slight change in the colors or patterns of the female bee, the pollination success will be reduced unless the orchid coevolves to maintain the resemblance of its petal to the female bee. 	In situ	ex situ	<p>It is the method of protecting the endangered species of the plants or animals in the natural habitat, either by protecting or cleaning up the habitat itself or by defending species from predators.</p> <p>It helps in recovering populations in the surroundings where they have developed their distinct features.</p>	<p>It is the method of protecting endangered species of plants and animals by removing them from the unsafe or threatened habitat and placing under the care or humans.</p> <p>It helps in recovering populations or preventing their extinction under simulated conditions that closely resemble their natural habitats.</p>	5
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20	<p>(a) habitat loss and fragmentation</p> <ul style="list-style-type: none"> - It is the primary cause for extinction. - The tropical rain forests initially covered 14% of the landsurface of the earth, but now they cover only 6% of land area. - Total loss of a habitat deprives many animals and plant of their homes and they face extinction. -When a large habitat becomes fragmented, animals requiring large territories and those with certain migratory habits startdecreasing. <table border="1" data-bbox="250 1763 1382 2080"> <thead> <tr> <th data-bbox="250 1763 799 1800">In situ</th> <th data-bbox="805 1763 1382 1800">ex situ</th> </tr> </thead> <tbody> <tr> <td data-bbox="250 1809 799 2080"> <p>It is the method of protecting the endangered species of the plants or animals in the natural habitat, either by protecting or cleaning up the habitat itself or by defending species from predators.</p> <p>It helps in recovering populations in the surroundings where they have developed their distinct features.</p> </td> <td data-bbox="805 1809 1382 2080"> <p>It is the method of protecting endangered species of plants and animals by removing them from the unsafe or threatened habitat and placing under the care or humans.</p> <p>It helps in recovering populations or preventing their extinction under simulated conditions that closely resemble their natural habitats.</p> </td> </tr> </tbody> </table>	In situ	ex situ	<p>It is the method of protecting the endangered species of the plants or animals in the natural habitat, either by protecting or cleaning up the habitat itself or by defending species from predators.</p> <p>It helps in recovering populations in the surroundings where they have developed their distinct features.</p>	<p>It is the method of protecting endangered species of plants and animals by removing them from the unsafe or threatened habitat and placing under the care or humans.</p> <p>It helps in recovering populations or preventing their extinction under simulated conditions that closely resemble their natural habitats.</p>	
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21	<p>(a) major causes for loss of species include:</p> <ul style="list-style-type: none"> - Habitat loss and fragmentation. - Over-exploitation by man for natural resources. - Invasion of alien species, which compete with the native species and cause their extinction. - Co-extinction of related plants and animals. <p>(b) Biodiversity loss</p> <p>(i) habitat loss and fragmentation</p> <ul style="list-style-type: none"> - It is the primary cause for extinction. - The tropical rain forests initially covered 14% of the land surface of the earth, but now they cover only 6% of land area. - Total loss of a habitat deprives many animals and plants of their homes and they face extinction. - When a large habitat becomes fragmented animals requiring large territories and those with certain migratory habits start decreasing. <p>(ii) Over-exploitation</p> <ul style="list-style-type: none"> - When nature is over exploited by man for the natural resources, many species become extinct <p>(iii) Invasion by Alien Species</p> <ul style="list-style-type: none"> - The alien species become invasive and compete with native species and cause extinction of indigenous species. <p>(iv) Co-extinction</p> <ul style="list-style-type: none"> - It is a phenomenon in which when a species becomes extinct, the plant and animal species associated with it in an obligatory manner, also become extinct. <p>(c) As per the Upanishad itself, you don't have any right to kill other species; live and let others live.</p>	
22.	<p>a) Respect for nature, scientific attitude with a vision of the future</p> <p>b) We should conserve Biodiversity since it provides us</p> <ul style="list-style-type: none"> • Main source of food • Source of economically important fibers (cotton, flax, hemp, jute etc) • Plant products (gum, resin, dye, fragrance, waxes, wool, leather, honey, lac, pearl, ivory, silk, horns) • Drugs and medicine • Sports and recreation • Aesthetic value • Cultural value • Scientific research • Eco system services <p>c) In situ conservation: Sacred grove, Biosphere reserve (Terrestrial and Marine), National parks and Wild life sanctuaries etc)</p> <p>Ex situ conservation: a) Sacred plants, home gardens b) Seed banks, gene bank, cryopreservation c) Botanical garden, Zoological garden, Aquaria etc.</p>	4