UNIT – X : ECOLOGY AND ENVIRONMENT

Term-II

BIODIVERSITY AND CONSERVATION

Syllabus

- *Concept, patterns, importance; loss of biodiversity; biodiversity conservation; hotspots, endangered organisms, extinction, Red Data Book, Sacred Groves, biosphere reserves, national parks, wildlife, sanctuaries and Ramsar sites.*

STAND ALONE MCQs (1 Mark each)

Q. 1. The most important cause of biodiversity loss is :

(A) Over exploitation of economic species

(B) Habitat loss and fragmentation

(C) Invasive species

(D) Breakdown of plant-pollinator relationships

U **[CBSE SQP, 2020]**

Ans. Option (B) is correct.

Explanation : When large habitats are broken up into small fragments due to various human activities, mammals and birds requiring large territories and certain animals with migratory habits are badly affected, leading to population declines.

Q. 2. Alexander von Humboldt described for the first time :

(A) Ecological Biodiversity

(B) Laws of limiting factor

(C) Species-Area relationship

(D) Population Growth equation

Ans. Option (C) is correct.

Explanation : Alexander Von Humboldt noticed that within a region species richness increases with the increase in area.

Q. 3. Which one of the following shows maximum genetic diversity in India ?

(A) Rice **(B)** Maize

(C) Mango **(D)** Groundnut

Ans. Option (A) is correct.

Explanation : Rice has more than 50,000 genetically different strains while mango has 1000 varieties in India.

Q.4. Which of the following countries has the highest biodiversity?

(A) Brazil **(B)** South Africa

(C) Russia **(D)** India R

Ans. Option (A) is correct.

Explanation : Brazil is the country with the greatest biodiversity of flora and fauna on the planet. It has the highest number of species of known mammals and fresh-water fish, and more than 50,000 species of trees and bushes. It takes first place in plant diversity. The climate of Brazil remains relatively undisturbed, constant and predictable giving tune for diversification, which favours rich biodiversity.

Q. 5. Which of the following is not a cause for loss of biodiversity?

(A) Destruction of habitat

(B) Invasion by alien species

(C) Keeping animals in zoological parks

(D) Over-exploitation of natural resources U

Ans. Option (C) is correct.

Explanation : Keeping animals in zoological parks is not a cause for loss of biodiversity. The important factors causing loss of biodiversity are as follows : (i) Destruction of natural habitat (primary cause) (ii) Introduction of exotic

(alien species) and indigenous species (iii) Over-exploitation of natural resources (iv) Co-extinction of species.

Q. 6. Where among the following will you find pitcher plant?

(A) Rain forest of North-East India

(B) Sundarbans

(C) Thar desert

(D) Western ghats R

Ans. Option (A) is correct.

Explanation : Pitcher plant (Nepenthes) is an insectivorous plant, found in rain forest of North-East India. They generally grow in nitrogen-deficient soil. Sundar bans are rich in fauna and flora. Mangrove plants are the characteristic of Sundar bans. Western Ghats are rich in biodiversity. Xerophytes are more common in Thar deserts.

Q. 7. What is common to the following plants : *Nepenthes, Psilotum, Rauwolfia and Aconitum*?

(A) All are ornamental plants.

(B) All are phylogenic link species.

(C) All are prone to over-exploitation.

(D) All are exclusively present in the eastern Himalayas. U

Ans. Option (C) is correct.

Explanation : All of the above plants are prone to over-exploitation due to their respective properties. Nepenthes (pitcher plant) is an insectivorous plant. *Psilotum* is a pteridophyte and *Aconitum* is a medicinal plant.

Q. 8. The species-area relationship is represented in .....form on a log scale. R

(A) linear **(B)** parabolic

(C) straight **(D)** linear and parabolic

Ans. Option (A) is correct.

Explanation : The species-area relationship is represented in linear form on a log scale.

Q. 9. Biodiversity is affected by

(A) latitudinal gradients

(B) species-area relationship

(C) Both (A) and (B)

(D) None of the above R

Ans. Option (C) is correct.

Explanation : Biodiversity is not uniform throughout the world. It varies with the change in latitude and altitude, it is affected by latitudinal gradients and species-area relationship.

Q. 10. World Summit on Sustainable Development (2002) was held in :

(A) Brazil

(B) Sweden

(C) Argentina

(D) South Africa

Ans. Option (D) is correct.

Explanation : The World Summit on Sustainable Development took place in Johannesberg, South Africa.

Q. 11. Sacred groves are specially useful in :

(A) preventing soil erosion

(B) year-round flow of water in rivers

(C) conserving rare and threatened species

(D) generating environmental awareness

Ans. Option (C) is correct.

Explanation : Sacred grooves are method for in situ conservation of biodiversity and conserving rare threatened species.

Q.12. Cryopreservation of gametes of threatened species in viable and fertile condition can be referred to as :

(A) in site conservation of biodiversity

(B) advanced ex site conservation of biodiversity.

(C) in site conservation by sacred groves.

(D) in site cryo-conservation of biodiversity

Ans. Option (B) is correct.

Explanation : In recent years, ex-situ conservation has advanced by preserving the gametes of threatened species in viable and fertile condition for long periods using cryopreservation techniques.

Q. 13. Which one of the following is not a major characteristic feature of biodiversity hot-spots?

(A) Large number of species

(B) Abundance of endemic species

(C) Large number of exotic species

(D) Mostly located in polar regions R

Ans. Option (D) is correct.

Explanation : Biodiversity hot-spots specifically refer to 25 biologically rich areas around the world that have lost at least 70% of their original habitat. They are characterised by large number of flora and fauna, abundance of endemic species and also large number of alien or exotic species. They are mostly found in tropical and temperate regions. There are no biodiversity hot-spots in polar regions.

Q. 14. The one-horned rhinoceros is specific to which of the following sanctuary?

(A) Bhitar Kanika **(B)** Bandipur

(C) Kaziranga **(D)** Corbett park R

Ans. Option (C) is correct.

Explanation : One-horned rhinoceros is specific to Kaziranga National Park, which is situated in Golaghat and Nagaon districts of (Assam). Bhitar Kanika National Park is located in Odisha and is specific for salt water crocodile. Bandipur National Park (Mysore) too is specific for tigers. Corbett National Park is situated in district Nainital (Uttarakhand) and is specific for tiger. It is the first National Park of India, which is famous for tigers.

Q. 15. Amongst the animal groups given below, which one has the highest percentage of endangered species?

(A) Insects **(B)** Mammals

(C) Amphibians **(D)** Reptiles R

Ans. Option (C) is correct.

> ***Explanation :*** Amphibians have the highest percentage presently, 32% of all amphibian species in the world face the threat of extinction. Other than these, 23% of all mammal species and 12% of all bird species also facing the risk.

Q. 16. What is common to the techniques (i) in-vitro fertilisation, (ii) Cryopreservation and (iii) tissue culture?

(A) All are *in-situ* conservation methods.

(B) All are *ex-situ* conservation methods.

(C) All require ultra-modern equipment and large space.

(D) All are methods of conservation of extinct organisms. U

Ans. Option (B) is correct.

> ***Explanation :*** *In-vitro* fertilisation, cryo-preservation and tissue culture are all ex-situ conservation methods. Ex-situ (off site) conservation is a set of conservation techniques which involves the transfer of a target species away from its native habitat. At present gametes of threatened species can be preserved in viable conditions (at very low temperature −196°C) for longer duration by cryopreservation method. Fertilisation can be achieved in laboratory through the process of in-vitro fertilisation, and species can be propagated by tissue-culture method which is a plant breeding principle.

Q. 17. The historic convention on Biological Diversity held in Rio de Janeiro in 1992 is known as

(A) The CITES Convention

(B) The Earth Summit

(C) The G-16 Summit

(D) The MAB Programme

Ans. Option (B) is correct.

> ***Explanation :*** The historic convention on biological diversity held in Rio de Janeiro (Brazil) in 3–4 June, 1992 is known as the Earth Summit. CITES (Convention on International Trade in Endangered Species of wild flora and fauna) has helped in restricting poaching and loss of rare species. MAB stands for Man and Biosphere Programme, which undertakes establishment and maintenance of biosphere reserves.

Q. 18. The extinction of passenger pigeon was due to

(A) increased number of predatory birds.

(B) over-exploitation by humans.

(C) non-availability of the food.

(D) bird flu virus infection. R

Ans. Option (B) is correct.

> ***Explanation :*** Extinction of passenger pigeon *(Ectopistes migratorius)* was due to the combined effects of their natural dramatic population fluctuations and human over-exploitation. Factors like increase in number of predatory birds, non-availability of food and bird flu virus infection did not contribute to the extinction of passenger pigeon.

Q.19. What is common *to Lantana, Eichhornia* and African catfish?

(A) All are endangered species of India.

(B) All are key stone species.

(C) All are mammals found in India.

(D) All the species are neither threatened, nor indigenous species of India. R

Ans. Option (D) is correct.

> ***Explanation :*** Lantana, Eichhornia (water hyacinth) and African catfish (*Clarias gariepinus)* are neither threatened, nor indigenous species of India. They all are alien (or exotic) species which are invasive and have a harmful impact on the indigenous species leading to their extinction.

ASSERTION AND REASON BASED MCQs (1 Mark each)

Directions : In the following questions a statement of Assertion (A) is followed by a statement of reason (R). Mark the correct choice as :

(A) Both Assertion (A) and reason (R) are true and reason (R) is the correct explanation of Assertion (A).

(B) Both Assertion (A) and reason (R) are true but reason (R) is not the correct explanation of Assertion (A).

(C) Assertion (A) is true but reason (R) is false.

(D) Assertion (A) is false but reason (R) is true.

AI **Q. 1. Assertion (A) :** Biodiversity means diversity at species level.

Reason (R) : Biodiversity is a diversity not only at species level but at all levels of biological organization.

Ans. Option (D) is correct.

> ***Explanation :*** The term biodiversity is popularized by Edward Wilson, it is a diversity at all levels of biological organization from macromolecules within cells to the biomes.

Q. 2. Assertion (A) : Percentage of animals is more than the percentage of plants.

Reason (R) : 70% of all the species are animals, while plants contribute nearly 22% of the total.

Ans. Option (A) is correct.

Explanation : Animals have a nervous system to receive stimuli and respond against them, they are mobile and can move the avoid competition.

Q. 3. Assertion (A) : Western ghats of India are one of the hot-spots of biodiversity.

Reason (R) : Western ghats have greater amphibian diversity than eastern ghats.

Ans. Option (B) is correct.

Explanation : Western ghats is one of the eight hotspots of biological diversity in the world due to its high level of biological diversity and endemism.

Q.4. Assertion (A) : Biologists are not sure about total number of prokaryotic species

Reason (R) : Nearly 45,000 species of plants and twice as many of animals have been recorded from India

Ans. Option (B) is correct.

Explanation : Biologists are not sure about total number of prokaryotic species because : (a) Conventional taxonomic methods are not suitable for identifying microbial species. (b) Many species are not culturable under laboratory conditions.

Q. 5. Assertion (A) : There is more species biodiversity in tropical latitudes than in temperate ones.

Reason (R) : Tropical environments, unlike temperate ones, are less seasonal, relatively more constant and predictable.

Ans. Option (A) is correct.

Explanation : Biodiversity (species richness) is highest in tropics because (i) Tropics had more evolutionary time. (ii) Relatively constant environment (less seasonal). (iii) They receive more solar energy which contributes to greater productivity.

Q. 6. Assertion (A) : Process of extinction is random and fast.

Reason (R) : Any species which can not adapt itself according to the environment, it cannot survive.

Ans. Option (D) is correct.

Explanation : If an organism fails to adapt itself according to the environment, it will not survive.

Q. 7. Assertion (A) : Loss of habitat is the main cause of loss of biodiversity.

Reason (R) : This causes the increase in edge area and reduction in core area.

Ans. Option (C) is correct.

Explanation : There are many reasons behind the loss of biodiversity among them habitat loss is one, others are over-exploitation, alien-species invasions, co-extinctions.

Q. 8. Assertion (A) : Biosphere reserves are also included under the ex-situ conservation strategies.

Reason (R) : Cropping and grazing are allowed in the transition zone of biosphere reserve.

Ans. Option (D) is correct.

Explanation : Biosphere reserves are included under the *in situ* conservation strategies.

Q.9. Assertion (A) : Sacred groves are highly protected.

Reason (R) : They are of religious importance to the communities.

Ans. Option (A) is correct.

Explanation : Sacred groves are highly protected by certain communities because they are of religious importance to the communities. They have a significant role in in-situ conservation.

Q.10. Assertion (A) : Many species like Stellar's sea cow, passenger pigeon, etc., became extinct due to over exploitation.

Reason(R) : Over exploitation is a major cause of biodiversity loss.

Ans. Option (B) is correct.

Explanation : Many species like Stellar's sea cow, passenger pigeon, etc., became extinct due to over exploitation. The dependence of humans on nature for food and shelter led to over exploitation of natural resources. It is one of the major causes of biodiversity loss.

CASE-BASED MCQs

Attempt any four sub-parts from each question. Each sub-part carries 1 mark.

I. Read the following text and answer the following questions on the basis of the same:

Excessive exploitation of species, whether a plant or animal reduces the size of its population, so it becomes vulnerable to extinction. Such as Dodo and passenger pigeon have become extinct due to over exploitation by humans. Thus, the world is facing accelerated rates of species extinctions, largely due to human interference.

Q. 1. Identify a cause of biodiversity loss that is not included in evil quartet?

(A) Coextinction **(B)** Pollution

(C) Alien species invasion

(D) Habitat loss and fragmentation

Ans. Option (B) is correct.

Explanation : Evil quartet, i.e., four major causes of biodiversity loss are habitat loss and fragmentation, over exploitation, alien species invasion and co-extinction.

Q. 2. The species that have become extinct due to over exploitation is/are :

(A) Stellar sea cow **(B)** Yucca moth

(C) *Blatta orientalis* **(D)** Nile Perch

Ans. Option (A) is correct.

Explanation : Steller's sea cow has become extinct in the last 500 years due to overexploitation by humans.

Q. 3. Factors which make species susceptible to extinction are:

(A) Small population size

(B) Higher status of trophic level

(C) Inability to switch over to alternate food

(D) All of the above

Ans. Option (D) is correct.

Explanation : Population traits which make species susceptible to extinction are: small population, higher status of trophic level and inability to switch over to alternate foods.

Q. 4. Assertion : Pollution reduces species biodiversity.

Reason : Spillover of oil in sea causes death of several marine animals.

(A) Both assertion and reason are true and reason is the correct explanation of assertion.

(B) Both assertion and reason are true but reason is not the correct explanation of assertion.

(C) Assertion is true but reason is false.

(D) Both assertion and reason are false.

Ans. Option (C) is correct.

Explanation : Spillover of oil in sea causes death of several marine animals this pollution reduces species biodiversity.

Q. 5. _____is the first major cause of species extinction.

(A) Coextinction **(B)** Over exploitation

(C) Habitat destruction **(D)** Alien species invasion

Ans. Option (C) is correct.

Explanation : Habitat destruction is the first major cause of species extinction.

II. India is divided into 10 biogeographical regions. Varying physical conditions and species grouping India has rich species diversity. Tropics are rich centre of biodiversity. Warm temperature, high humidity in tropical areas provide favourable conditions throughout the years. Rich diversity is important for stability, productivity for ecosystems.

Q. 1. Which among the following represents diversity at ecosystem level ?

(A) Genetic diversity **(B)** Ecological diversity

(C) Species diversity **(D)** Species evenness

Ans. Option (B) is correct.

Explanation : Diversity of plants an animals at ecosystem is called ecological diversity.

Q. 2. Which of the following taxon shows maximum species diversity ?

(A) Fishes **(B)** Beetles

(C) Orchids **(D)** Ants.

Ans. Option (B) is correct.

Explanation : Beetles shows maximum diversity in species as it represent the largest order of insects.

Q. 3. What is the approximate ratio of animals and plant species in our country ?

(A) 3 : 1 **(B)** 2 : 1

(C) 1 : 3 **(D)** 1 : 2

Ans. Option (B) is correct.

Explanation : Ratio of plants and species in India is 2 : 1.

Q. 4. When group represents minimum species diversity among vertebrates ?

(A) Birds **(B)** Mammals

(C) Reptiles **(D)** Amphibians

Ans. Option (B) is correct.

Explanation : Among the vertebrates, minimum diversity is represented by amphibian and followed by reptiles, birds and mammals.

Directions : In the following questions a statement of Assertion (A) is followed by a statement of reason (R). Mark the correct choice as :

(A) Both Assertion (A) and reason (R) are true and reason (R) is the correct explanation of Assertion (A).

(B) Both Assertion (A) and reason (R) are true but reason (R) is not the correct explanation of Assertion (A).

(C) Assertion (A) is true but reason (R) is false.

(D) Assertion (A) is false but reason (R) is true.

Q. 5. Assertion (A) : Tropics have more biodiversity.

Reason (R) : Climate of tropical region is more seasonal.

Ans. Option (C) is correct.

Explanation : Tropics have more biodiversity due to warm temperature and high humidity.

III. Pollution, climate changes, over-exploitation by human etc. are responsible for changes in the ecosystem. Change in an ecosystem is responsible for depletion in biodiversity which directly or indirectly affects human beings and their surrounding. So it is important to conserve the biodiversity. There are various methods like in-situ conservation, *ex situ* conservation by which we can conserve our biodiversity.

Q. 1. How many biodiversity hot-spots are identified globally ?

(A) 20 **(B)** 3

(C) 34 **(D)** 50

Ans. Option (C) is correct.

Explanation : There are more than 30 biodiversity hot-spots in the world. India have 4 biodiversity hot-spots.

Q. 2. Main cause of extinction of animals and plants is :

(A) Habitat loss and fragmentation

(B) Competition between species

(C) Over-exploitation

(D) Alien species invasion.

Ans. Option (A) is correct.

> ***Explanation :*** Due to habitat loss animals migrates and losses their favourable condition, food, temperature water that makes difficulty is surviving and become extinct.

Q. 3. Protected areas are example of

(A) In-situ conservation

(B) Ex-situ conservation

(C) Cryopreservation

(D) Green houses.

Ans. Option (A) is correct.

> ***Explanation :*** Conservation of plants and species with in thee suitable boundary of natural surroundings.

Q. 4. Name the National Aquatic Animal of India ?

(A) Sea-horse (B) Gangetic shark

(C) Blue whale (D) River dolphin

Ans. Option (D) is correct.

> ***Explanation :*** Dolphin is the national aquatic animals of India.

Q. 5. Species at the high risk of extinction in the future is called :

(A) Vulnerable (B) Extinct

(C) Endemic (D) Critically Endangered

Ans. Option (D) is correct.

> ***Explanation :*** The species of an organism lasting with the change in suitable condition of survival with thee time. Such species are called critically endangered.